



CALIFORNIA MANAGEMENT REVIEW

Winter, 1960

VOLUME II • NUMBER 2

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Edited under the direction of the Faculties of the De-
partments of Business Administration, University of
California, Berkeley and Los Angeles.

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The *California Management Review* seeks to build a bridge between creative thought about management and executive action. In pursuit of this objective, the *Review* is intended to serve as an authoritative source of information and ideas contributing to the advancement of management. It is directed to active managers, scholars, teachers, and others concerned with management.

Specifically, the *Review* will publish:

1. Results of research in all areas of knowledge which have significance for the management of both public and private enterprise.
2. Analyses of economic, political, and social issues and trends important to management.
3. Descriptions and evaluations of new techniques in management.
4. Discussions of theory, principles, and philosophy underlying business policies and operations.
5. Reports on work in the other social sciences, in the humanities, and in the physical sciences having implications for management.

Manuscripts may be of whatever length is necessary to present the material clearly and concisely. They should be submitted in triplicate.

The Editors extend a special invitation to readers of the *Review* to comment on the articles. Comments and manuscripts should be addressed to:

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Prizes of \$1000 and \$500 will be awarded each year to the authors of the two best articles appearing in the *Review* that year. These awards have been made possible by the McKinsey Foundation for Management Research, Inc. Neither the Editors nor members of McKinsey and Company are eligible for the awards.

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9 SELECTING THE RESEARCH PROGRAM: A TOP MANAGEMENT FUNCTION

Research without management control, says one outstanding management consultant, can mean money down the drain. Do you, as a manager, exert enough control over your company's R&D programs?

• **C. WILSON RANDLE** is a partner in charge of management research of Booz, Allen & Hamilton, nationwide management consulting firm. Since joining the firm in 1952, he has conducted research in new management techniques as well as participating in consulting assignments for scores of business organizations. Mr. Randle has served as Dean of the School of Business, Western Reserve University, Cleveland; Head of the Department of Economics, Texas A & M College; and regional director of the U. S. Bureau of Labor Statistics (Dallas, Texas). He is the author of *Collective Bargaining* (Houghton-Mifflin, 1951; Spanish Edition 1958), and has written numerous articles in the management field.

16 WHEN SHOULD A COMPANY MANUFACTURE ABROAD?

Lower industrial wage levels in Europe have run many U. S. companies some tough competition, both at home and on the foreign market. But if you are one of those who hope to solve the problem by manufacturing abroad, read this article and then think it over.

• **ELWOOD S. BUFFA** formed many of the impressions documented in this article during the year he spent traveling in Europe and teaching at IPSOA, a graduate school of business in Turin, Italy. He has served with the Eastman Kodak Company and a number of other firms in southern California, and was Vice-President, Western Region of the American Institute of Industrial Engineers and President of the Los Angeles chapter. He is now Associate Professor of Production Management, School of Business Administration, University of California, Los Angeles.

• **ALEXANDER E. BOGARDY** has received recognition as the instigator of many of the productivity actions which contributed to the spectacular recovery of France after World War II. Mr. Bogardy joined the Economic Cooperation Administration in 1952 and served first as a member of the U. S. Economic Mission to France and later as chief U. S. adviser to the French government on matters of productivity. In acknowledgment of his outstanding services, the President of France conferred on him the Knight's Cross of the Legion of Honor. He is presently serving as U. S. adviser to Austria in management training and executive development.

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INTERNATIONALISM: A NEW CONCEPT FOR U. S. BUSINESS 28

As U. S. businesses emerge into international enterprises, a new type of top-level management must evolve ... management that is trained to think and work in the perspective of a world-wide market. John J. Beauvois poses this question: Will the next generation of management be ready for the task?

• JOHN BEAUVOIS, a specialist in the field of international marketing and organization problems, is an Associate with McKinsey & Company, Inc., international management consultants. Before joining McKinsey, he served with the International Division of Warner Lambert Pharmaceutical Company. In that position he handled various assignments, primarily in the fields of marketing and finance, both at the company's headquarters and in several foreign countries.

INDUSTRY'S ROLE IN METROPOLITAN GROWTH: A PUBLIC MANAGEMENT PROBLEM 38

Most forecasters predict our growing population will concentrate in great metropolitan areas. James Gillies, in this study of California, specifies what states faced with fast-growing metropolitan areas must do to maintain a healthy balance between industrial and population patterns of growth.

• JAMES GILLIES is a well-known consultant in land-use problems and has worked on projects for numerous private firms, local and state governments, and the Federal government. He is the author of two books on housing problems, numerous studies concerning town planning and urban land use, and articles on the building industry in southern California. Mr. Gillies was recently elected to the Board of Directors of the Construction Industry Research Corporation and is currently serving as Economic Adviser to the Building Contractors Association of California. He is Assistant Dean of the School of Business Administration and Associate Professor of Real Estate and Urban Land Economics at the University of California at Los Angeles.

HOW TO EVALUATE INVESTMENT PROPOSALS 47

Capital investment decisions are among the most important a manager must make. This article shows how an integrated capital budgeting system can be used by a company to evaluate its existing investments as well as new capital expenditure proposals.

• SEYMOUR FRIEDLAND, who earned his Ph.D. in economics at Harvard, is now Assistant Professor of Business Administration at Rutgers and Director of the New Jersey Business Research Project. A contributor to journals in the field, he is, as a partner in Friedland and Moranian Associates, industrial consultants, a practicing manager as well as a student of management.

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57 MARKET MANAGEMENT IN A FREE SOCIETY

Ralph Cassady describes some of the ingenious methods which have been employed to keep tabs on consumer buying tastes and habits in a society where there is so much to choose from and no controls over choice.

• RALPH CASSADY, JR., has made numerous studies of marketing problems, many of which have been reported in economic and business journals. He has served on the Board of Directors of the American Marketing Association and was both Managing Editor and Editor-in-Chief of Policies Committee of the Social Science Research Council. Mr. Cassady is now serving as Professor of Marketing and Director of the Bureau of Business and Economic Research at the University of California, Los Angeles. He is the author or co-author of five books.

67 UNDERSTANDING LEASE FINANCING

Lease financing, some say, serves a basic economic function. Some say it has become a fad. This article provides a framework for understanding the intricacies of sale and lease-back and explains what financial advantages and disadvantages this type of investment offers to businessmen.

• J. FRED WESTON is a noted authority on financial planning and policies. He has served as consultant to the President of the American Bankers Association as well as to a number of private corporations. He is a member of the Committee on Analysis of Economic Census Data of the Social Science Research Council and a member of the board of directors of an investment company. Mr. Weston has been Associate Editor of the *Journal of Finance*, and is presently serving on the Editorial Board. He is now Professor of Business Economics and Finance in the Graduate School of Business Administration, University of California, Los Angeles. Mr. Weston is the author of several books and articles on financial planning.

• RUPERT M. CRAIG is an Assistant Professor of Business and Economics at Los Angeles State College. His career has included positions as Teaching Associate, Business Administration, University of California, Los Angeles; Associate Professor and Head of Business and Economics, Southern Missionary College, Collegedale, Tennessee, and Lecturer in Business Administration, Atlantic Union College, South Lancaster, Massachusetts.

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THE EFFECTS OF INFLATION ON LIFE INSURANCE 76

Life insurance, David B. Houston points out, provides no hedge against inflation. As a result, investors are buying term insurance instead of retirement or endowment contracts and have invested the premium difference in other savings. Will this trend hurt the life insurance industry?

• DAVID B. HOUSTON is well versed in the problems of insurance. He is an Assistant Professor of Insurance at the University of California, Los Angeles, and has served as Instructor in Insurance at the University of Pennsylvania. In 1957 he was made an Associate Member of the Casualty Actuarial Society.

A SYSTEM FOR MEASURING OFFICE WORK PERFORMANCE 80

Evaluating the performance of office work can be one of the knottier administrative problems, particularly in a large, complex organization. Kenneth W. Olm reports a case study of a work measurement system which could be employed in any large-scale office operation.

• KENNETH W. OLM has been a management consultant to a number of industrial firms as well as with the United States Air Force, and has participated in a number of management development programs at the University of Texas. He has taught in the Department of Economics and Business Administration at Texas Western College and is now Assistant Professor of Management at the University of Texas.

THE CAUSES OF MANAGEMENT CONFLICT 90

Unions and workers have no fence around conflict. Management, too, is subject to costly conflict within its ranks. In this article, T. E. Stephenson analyzes some of the trouble spots inherent in internal management relationships.

• T. E. STEPHENSON is the author of several articles dealing with the sociological problems of industry. He recently has been appointed Lecturer in the Department of Adult Education and Extra-Mural Studies at the University of Leeds, England. Mr. Stephenson lectured at the Centre for Management Studies of the Royal College of Science and Technology, Glasgow, Scotland.

THE MCKINSEY AWARDS FOR 1958-1959

The Editors are pleased to announce the McKinsey Foundation Awards for the best articles published in Volume I of the *California Management Review*.

First prize of \$1000 goes to Chester I. Barnard for his article, "Elementary Conditions of Business Morals" (Fall, 1958). In this article, Mr. Barnard describes how much of business behavior is motivated by moral considerations, the classes of business morality, the kinds of conflicts they involve, and ways these conflicts can be resolved. Mr. Barnard is a distinguished businessman, foundation executive, public servant, and author of two classics on management, *The Functions of the Executive* and *Organization and Management*. W. H. Knowles, author of "Human Relations in Industry: Research and Concepts" (Fall, 1958), and James R. Jackson, author of "Learning from Experience in Business Decision Games" (Winter, 1959), tied for the \$500 second prize. Mr. Knowles is an Associate Professor, Department of Economics and Business Administration, Universidad Interamericana, San German, Puerto Rico. His article explored both the useful and the "mystical, cultist" applications of human relations concepts in industry. Mr. Jackson is Associate Professor of Business Administration and Director, Western Management Science Institute, at the University of California, Los Angeles. His article described a new and powerful tool for training managers—the business decision game.

These awards were judged by the *Review's* Advisory Board of Editors. Similar awards for the two best articles published in the *California Management Review* in 1960 will be made from a grant for this purpose by the McKinsey Foundation for Management Research, Inc.

Selecting the Research Program: A Top Management Function

C. WILSON RANDLE

This article cites nine practical steps to follow if you want your company's R&D program to be more productive.

The decision by American businessmen to increase research expenditures despite the deteriorating effect of the recession on profits and sales was one of the more important economic developments of last year. Expenditures for research and development totaled \$8.2 billion in 1958, 12 per cent over the 1957 total and a new record.

Plans call for expenditures of \$9 billion this year and \$10.6 billion a year by 1962.¹ This trend toward greater research expenditures began a decade ago and has been consistent in its upswing.

Much has been written about the magnitude of today's research endeavors. Far less has come to print about the fundamental reasons for industry's increased research expenditures.

Research, of course, has long been considered the growth stimulus of industry. In fact, a good case can be made that the strongest growth industries are those spending the most on research, those oriented to research as a way of corporate life. By way of example, two of our strongest growth industries are the aircraft industry, which spends almost four times as much on research as on plant expansion, and the electrical machinery industry, where the ratio of research to plant expansion is almost three to one.

A similar pattern exists for other growth industries, such as electronics or drugs. From evidences available, research and growth ap-

pear to be close companions—a kinship that has not gone unnoticed by industry.

Research as an Economic Necessity

Within recent years, research has been fast becoming a basic economic necessity. Its increasing necessity has been dictated by the prevailing characteristics of our economic system, characteristics which have teamed up to cause a rather steady pressure on business profits.

The most influential of these characteristics are a growing competitiveness, steadily rising costs, and shortening product life cycles. It is no coincidence, then, that much industrial research is aimed directly at overcoming these unwelcome business influences.

For example, the major purpose of research among manufacturing industries is to generate new products where the profit margins will be greater over longer periods because of accruing competitive advantages.²

Another primary purpose of research is to improve present products—often described as “defensive” research. This is research primarily aimed at maintaining or improving market position.

The third purpose is to develop new or improved processes, with the intent of reducing costs or improving productive effectiveness.

All, of course, hinge on creating greater profitability. There are few tasks of more

¹ *Business' Plans for New Plants and Equipment*, 12th Annual Survey, McGraw-Hill, Department of Economics, 1959, p. 13.

² For all manufacturing, 48 per cent of the research effort goes into new products, 41 per cent into improving present products, and 11 per cent into developing new or improved processes. (*Business Plans 1958-1961*, McGraw-Hill, Department of Economics, 1958, p. 8).

fundamental magnitude than those already mentioned.

This thought has been well expressed by a prominent business executive who has stated:

"Research and development, in this era of unprecedented technological activity and progress, may have a more important bearing on the future of a business than any other major effort in which the company is engaged."³

It seems clear, then, that many businesses today fail or succeed, depending on the effectiveness of their research. The number of businesses that fall into this category is increasing daily. Thus, R&D is fast becoming the insurance for tomorrow's business.

This critical dimension of research, plus the long acknowledged growth incentive provided by it, makes the attention of top management to the research program mandatory. Perhaps this can be better emphasized by considering that the research program determines what products the business will have. Determining the products literally determines what the business will be in the future. Therefore, if management gives up leadership of the research program, it gives up leadership of the enterprise.

Research and the Product Life Cycle

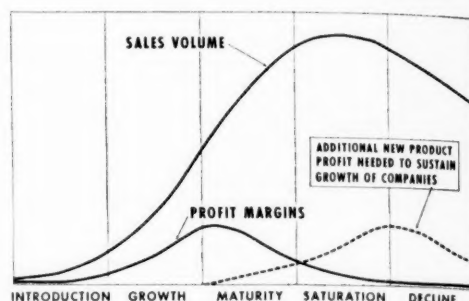
The shortening life cycles of products bears significantly on the proper planning of research by top management. Analysis shows that every product tends to pass through a rather well defined life cycle. An abstraction of this life cycle is pictured in Figure I.⁴

Most products go through a period of introduction, or market entry, which is slow in sales results. The product then catches on and enters a period of rapid growth, followed by a period of maturity where sales still increase but not at so fast a rate.

The growth period is followed by a saturation period where the competitive lead has

FIGURE I

THE BASIC LIFE CYCLE OF NEW PRODUCTS



SOURCE:
Management Research Department
Booz, Allen and Hamilton, 1959.

been eliminated. Other companies have initiated production, and supply tends to outstrip demand. From this point, product sales move into decline.

Although the general shape of this cycle tends to remain rather constant for all products, the length of the cycle tends to vary rather significantly between industries and products.

As a generality, basic and producers' goods industries tend to have longer cycles. The closer the product comes to the consumer and the vagaries of the market place, the shorter the cycle becomes. Thus, steel and machine tools may have life cycles of 25 to 50 years. The cycles of pharmaceuticals, cosmetics, or grocery products may range from one to four years.

From this life-cycle concept come two major influences on the management planning of research. First, the apex of the profit-margin curve is reached far sooner than the apex of the sales-volume curve (see Figure I). This is an often overlooked phenomenon. Management tends to plan around the sales volume rather than the profit yield of the product. If this normal inclination is followed in planning for new products (the province of R&D), the company invites profit deterioration. The reason is clear. By the time that sales start to fall off significantly, profits may be lean indeed, if existent at all.

³ Wallace McDowell, "Company Policy and Research Management," American Management Association, 1955, p. 9.

⁴ *The Management of New Products*, Management Research Department, Booz, Allen & Hamilton, Chicago, 1957.

Product Profit Performance

The first fundamental of planning that grows out of the life-cycle concept, then, is to key the planning to product profit performance rather than sales volume. From this concept grows the necessity for having an inventory of new products whose introduction and commercialization can be timed to produce a series of interlocking profit waves which sustain company growth and success. Only top management has the perspective and leverage to ensure this result.

The second planning consideration emanating from the life-cycle concept is that the length of the cycle almost dictates the amount of effort and expenditure that is required for R&D. Businesses having short product life cycles must give greater accent to research and development.

The machine tool manufacturer, for instance, can live a more leisurely research life and may spend only a very small percentage of his sales dollar on research. On the other hand, the drug manufacturer must vigorously pursue his research program, spending perhaps five to seven per cent of sales on R&D. The alternative may be economic extinction.

Therefore, the degree of pressure created by the length of the product life cycle largely accounts for some industries spending less and others more on research.

It can logically be concluded that companies with short product life cycles will have to put more planning effort and investment into R&D than those companies favored with longer cycles. Top management should consider this a cardinal principle.

Research Mortality

The rather high mortality rate of research projects is another factor commanding top management's attention to the research program. There tends to be a fairly close correlation between the mortality of these projects and the life-cycle concept.

Those industries closer to the consumer and with shorter product life cycles tend to

have greater research project mortality. Those at the other end of the industrial spectrum have the lowest project mortality. In both cases, however, the project mortality rate seems higher than can be justified.

It is understood, of course, that the nature of the scientific task has inherent hazards that make some mortality inevitable, and also that some companies may be willing to stand a very high mortality to achieve a single breakthrough or "business making" result.

A recent research study completed by Booz, Allen & Hamilton disclosed that, in the average industrial situation, approximately two-thirds of the R&D projects designed for a market appearance will never reach the market place.⁵

No matter how you look at it, this is a situation deserving attention. The money dimensions alone are significant. The average annual cost per scientist and engineer may range from \$17,000 to \$35,000, depending upon the industry involved.⁶

Thus, money dissipated by high project mortality can be significant. But even more important, a high mortality rate may retard the over-all research effort, cripple the growth impetus of the business, and cause severe profit erosion.

The reasons for this high mortality are various, but one thing seems clear. Few projects fail because of technical reasons. By and large, the technical ability of R&D personnel is excellent. Most research projects fail because the project concept was wrong in the first place. For example, the project did not fall within company fields of interest, the timing was bad, or people didn't want to buy the resulting product. In most cases, these bad research investments spring from faulty project selection.

Thus, it is again seen that top management's attention to the research program can

⁵ *The Management of Research and Development*, Management Research Department, Booz, Allen & Hamilton, Chicago, 1958, p. 13.

⁶ These figures include the salary of the scientist or engineer, the salaries of technicians and supporting workers, laboratory supplies, and a proper overhead loading factor. They do not include the cost of equipment or the facility.

yield highly significant dividends in enhanced research effectiveness, and hence yield better business profits.

Selection of the Research Program

What goes on in research inevitably affects every area of the company. The products emerging from research (in the absence of merger or acquisition) will shape the future contour of the business. For all practical purposes, the products are the business.

It stands to reason, then, that the selection of the research program should be a total integrated company task, with final approval resting with the chief executive. The organization for project selection should implement this concept.

It seems particularly appropriate to mention here the growing importance of marketing in project selection. Many companies in today's competitive environment are finding it increasingly easier to make new products than to sell them. Consequently, these companies tend to work from the market place back to research rather than the opposite. They find what products need to be developed and then develop them. Since this development role rests with research, the major influences today in project selection are marketing and research.

Most companies have organized to reflect these two major functions in selecting the research program. Some, however, have neglected to reflect, in organizing to select research projects, the importance of other company areas.

The inclusion of other company functions may be a virtual necessity. For example, the emergence of a new or improved product frequently generates a new tooling requirement. This may be a major influence. As a consequence, many companies include engineering in the program selection group.

Almost as frequently, finance is included. The capital and expenditure requirements of a new or improved product are many times of great moment. The uniqueness of company operations may dictate the inclusion of other company functions—such as advertis-

ing or purchasing—but the four areas cited (research, marketing, engineering, and finance) appear to be a minimum nucleus with which to provide the experience and background necessary for effective and far sighted selection of the research program.

This selection group, of course, provides the variety of viewpoints necessary for appraisal of a project proposal. The final decision on the projects selected rests with the chief executive, who cannot often delegate the decision. He can never delegate his responsibility for the decision, for the consequences rest squarely on his office.

This is the generality of the matter. Specifically, there are some nine steps which can be invoked to improve the research program selection process.

1. Identify Company Fields of Interest

It is just as easy to come up with pertinent as it is impertinent product ideas. Put it another way. People can be just as creative within defined limits as they can all over the landscape.

A careful delineation of company fields of product interest will go far in providing proper and effective dimensions within which to generate product ideas. The more specifically these fields can be defined, the more direction will be provided. For example, if a company's interest is to grow in whatever field is profitable, strong pay-out product ideas are hard to come by. On the other hand, if a company is interested in only a single field of endeavor, such as electronic instruments, product ideas come much easier.

Identifying company fields of interest is thus a primary step in making project selection more effective.

2. Communicate Fields of Interest

Management needs next to communicate the company fields of interest to personnel most likely to get new product ideas. This is necessary if there is to be "directed creativity." New idea persons or areas may vary somewhat from company to company. In

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general, the marketing and R&D people are most prolific with pertinent ideas (see Table I for sources of new product ideas).

TABLE I
SOURCES OF NEW PRODUCT IDEAS
71 Major Companies

	<i>Per Cent of Ideas</i>
Marketing	32.4
R&D	26.5
Top Management	13.1
Customers	10.6
New Products Department	6.7
Manufacturing	3.7
All Others	7.0

SOURCE:
Management Research Department
Booz, Allen and Hamilton, 1959.

3. Build Idea Collection System

Most businesses have enough new product ideas with which to work. However, both quantity and quality of ideas will improve with an idea collection system. Almost always there are a number of good ideas rattling around in the business which have not been nailed down or expressed.

To set up a collection system, the company first should designate an idea collection station or point. Many times people with ideas don't know where to take them.

A direct route to this collection point should be designated. Ideas melt away when subjected to multiple transmission through a complex organizational structure. Expecting ideas to come up through an organization just as authority moves down is a false hope.

Although it may appear an organizational heresy, it is recommended that the idea route be direct to the collection point rather than through supervisory levels. Otherwise, many ideas, maybe the best ones, will be choked off by supervisors who do not have sufficient knowledge for a qualified judgment.

Finally, ideas have to be actively solicited. As nearly as can be determined, there is

little correlation between garrulity and creativeness. The quietest man in the company may be the most creative. Ideas have to be sought. Many will not gravitate to the collection center.

4. Screen the Ideas

Since both manpower and financial resources are usually limited, most companies cannot afford to develop all or most of the new-product ideas collected. Indeed, most companies cannot afford even thorough investigation of all ideas. Management should thus employ here, as it does elsewhere, the "greatest probability" approach. What ideas—quickly and inexpensively identified—offer the most promise?

This approach means certain screening criteria must be set up to drop out quickly new-product ideas of least promise. It is almost a toss-up as to whether company "fields of interest" or the estimated range of profit yield should be the first screening measure. Certainly, these are both primary persuaders. If ideas pass these tests, they can be screened against the feasibility—in a broad sense—of developing, manufacturing, and marketing the product. These major screens quickly get the bulk of the ideas out of the way so that attention can be paid to those with considerable promise.

It again should be emphasized that the screening group should be composed of representatives from each of the key company areas. No single area has the necessary experience or vision to levy effective unilateral judgment against the ideas available.

5. Expand Pertinent Ideas Into a Business Concept

With pertinent new-product ideas at hand as a result of screening, each idea now needs to be given rather detailed study and scrutiny. After the screening, each idea needs to be specifically evaluated. The best step at this point is to expand the idea into a business concept.

Most new-product ideas are either fragmentary or simply technical considerations.

Ideas in this form are difficult, if not impossible, for management to judge validly regarding their business propriety. A new-product idea as a business concept would involve, at a minimum, the development schedule, an estimated range of money to be spent, the estimated range of profit yield, and the company benefits to be derived other than direct profit yield.

Wise companies usually figure their "pay back" on the minimum range of profit yield, since there is enough risk already without extending vulnerability.

Most new-product ideas will drop out under the test of a full business concept. Remaining ones should be fully studied. At this point, some companies employ a product study team or task force to carry out the full investigation. Needless to say, full scrutiny of the ideas will cause many more to be dropped.

6. *Select Projects and Establish Their Priority*

Each remaining new-product idea now has been expanded to a business concept and fully investigated. Some companies find it advantageous to summarize findings and investigation in a "management" report. At any rate, the product idea should be described so that top management can assess it along with others and make a decision on which projects should be developed and in what order.

7. *Build Specifications for Each Approved Project*

To this point, we have dealt in product ideas or concepts. Much emphasis has been put on the correct formulation of these concepts because here the payout is greatest. If the concept is right, the research program will be right. If the concept is wrong, no amount of technical ingenuity can assure success.

The next step is to provide research with the guidance needed to keep the development of the product in line with top management decisions. This step involves agree-

ment on a time schedule for development, the money to be spent, and the desired design and performance characteristics to be engineered into the product. The latter will be in order of priority, for probably all cannot be achieved.

Research now has time, money, and product characteristics perimeters within which to carry out the development. These are the guide lines to be followed if the activities of research are to be integrated effectively with other functions of the business and thus assure product success.

8. *Recycle for Additional Authorization or Revised Specifications*

It is obviously impossible to foresee all of the problems and roadblocks R&D may encounter while the project is in the development process. However, it is clear that R&D must not violate the imposed project perimeters on its own. If it encounters circumstances that make it necessary to violate limits of time, money or product characteristics, the impending decision as to whether to continue the project is re-cycled to the organizational unit responsible for bringing a total company view into focus.

Now new limits may be set and the integrative process for other company areas revised. On the other hand, management may decide to kill the project to prevent further expenditures against an improbable product success. The company must be firm and non-emotional at this point. Money and manpower expended from here onward rise very rapidly.

9. *Continue Evaluation as Development Ensues*

Research may operate well within imposed limits yet still not develop a pertinent product. Successful companies today maintain a continuing evaluation of the product evolution within R&D. As research clothes a concept with the physical characteristics constituting a product, marketing or sales must be constantly answering the question: Will the design, characteristics, and per-

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Manufacturing, in a similar fashion, must determine whether the materials, design and performance are compatible with production possibilities. Engineering should constantly scrutinize the research project to be sure the right kind and amount of tooling will be ready at the right time. As projects develop, finance must be aware of tooling expenses, capital outlays, commercialization expenditures, and other monetary requirements and meet these needs effectively.

Thus, evaluation of evolving products within R&D is not simply a matter of technical inspection but rather must be looked at in terms of the management implications involved. Unless this is done, inappropriate products will be developed, useless money and manpower will be spent, and the future of the enterprise may possibly be jeopardized.

Conclusion

The worries of the chief executive are many. All functions naturally clamor for his attention, and he cannot attend to all. He must choose those, which in terms of his own company, are the most vital to business health and growth. Research and development meets these qualifications in the majority of prominent businesses. As Duer Reeves of Esso Research has said:

"Many companies and many industries realize today that technology is an important raw material in their operations. It is

no longer like the frosting on the cake but is a critical element in their diet. The effectiveness of industrial research can affect a company's competitive position, its future growth, its employee relations, its public relations, and almost everything else connected with what the company does."⁷

It is for this reason that selecting the research program is a top management responsibility which cannot be otherwise delegated.

Our basic theme is that when R&D fails to meet its objectives, with consequent detriment to the company, it is more often because of the concept than technical reasons. Poor concepts are derived from faulty project selection. Faulty project selection results from lack of proper management of the selection process.

A properly managed selection process requires an orderly organized approach with two dominant accents. *One*, in selecting the research program, a total integrated company viewpoint should be employed rather than the unilateral decision of any one company function. *Two*, realization must be paramount that selecting the research program means deciding the future course of the business, and this can only be a top management decision.

These two accents will tend to be reflected in an improved profit and loss statement—which even the most pessimistic businessmen will admit is a nice spot to be affected.

⁷ Maurice Holland, *Management's Stake in Research*, 1958, p. 75.

When Should A Company Manufacture Abroad?

ELWOOD S. BUFFA / ALEXANDER E. BOGARDY

A comparison of U. S. and European wages, costs, and productivity that explains how and when it can be profitable for a U. S. business to manufacture abroad . . . and why it is still often more profitable to manufacture at home.

"Security Danger Seen in Foreign Competition" was the *Los Angeles Times* headline, (March 2, 1959) concerning the story of a large turbo generator to be bought by the City Department of Water and Power. "The lowest bid for this unit was made by an overseas supplier and was nearly three million dollars or 38 per cent below that of the lowest U. S. manufacturer."

The article indicated that the basic reason for the price difference was that the European worker is paid—"approximately one-third the rate of the equivalent U. S. skilled workers." The article summarized the potential danger of accepting such a bid as, (1) one to national security in case of breakdown of such equipment during wartime, (2) gradual disintegration of the country's production facilities, (3) the loss of jobs to American labor, and (4) the effect on tax revenue due to loss of wages, which must be made up from some other source.

Another article entitled "26 Cents an Hour vs. \$2.10—a Spread in Pay that Worries U. S. Business," appeared in *U. S. News and World Report*, April 25, 1958. Here the threat becomes very specific. It is summarized in Table I which was abstracted from the article.

This article points out that not only are wages low in the foreign countries, but that productive efficiency is rapidly rising. "Whole industries abroad have been rebuilt, practically from the ground up; Italy's auto indus-

try is almost brand new. So is the steel industry in France and West Germany. Japan and Italy have made great strides in constructing modern plants for producing chemicals and machinery."

Quoted in the same article from a speech by Roger M. Blough, chairman of U. S. Steel, was the example of a reel of barbed wire manufactured in Cleveland and delivered to a jobber's warehouse in the same city—"but in the jobber's warehouse it was placed alongside another reel of barbed wire that had been manufactured in Düsseldorf (Germany). That German wire was of exactly the same type, and it had come from a mill many thousands of miles away. It had been shipped from Düsseldorf to the sea, and across the ocean to New York. It had been freighted to Cleveland by rail, and hauled from the freight yards to the warehouse by truck. Yet, delivered to that warehouse, it still cost the jobber \$40.00 a ton less than the reel of wire we sold right here in Cleveland."

Is U. S. Pricing Itself Out of the Markets?

In an article, "Is U. S. Pricing Itself Out of Markets?" *U. S. News and World Report*, April 27, 1959, trends in the balance of imports and exports in industries like nails, barbed wire, bicycles, sewing machines, steel flatware, typewriters, fishing tackle, jeweled watches, and many others were analyzed for the period 1953 to 1958. While exports of

TABLE I

Average Wage per Hour for							
An Auto Worker		A Textile Worker		A Machinery Worker		A Steel Worker	
Germany.....	.61			Italy.....	.53		
France.....	.72	Japan.....	.16	Germany.....	.53	France.....	.55
Britain.....	.80	Britain.....	.70	Britain.....	.77	Japan.....	.56
U.S.....	\$2.48	U.S.....	\$1.50	U.S.....	\$2.34	U.S.....	\$2.76

U. S. manufactured goods have been slowing, imports of manufactured goods have been growing significantly. From 1953 to 1958 imports went up 77 per cent, from 2.2 billion to 3.9 billion dollars, while exports of U. S. manufactured goods went up only 27 per cent, from 7.4 billion dollars to 9.4 billion dollars.

Some industries, notably sewing machines and typewriters, include companies that have all but thrown in the towel so far as American production is concerned. These companies produce abroad and import their own foreign-made products to the U. S. for sale.

More recently, some of the stated company arguments in the steel wage negotiations which resulted in a strike on July 14th, 1959, were that further increases in labor costs would accentuate the declining position of the American steel industry in relation to European producers.

This threat from abroad is emphasized by two recent events, the formation of the common market in Europe, the French currency reform and further steps toward full convertibility in other countries which occurred during the first week of January 1959.¹

The Common Market

The common market binds together a total potential market of 165 million people into what will eventually be a free-trade area for participating countries. This is roughly

¹ Present outside suppliers will partly suffer and partly benefit because the new tariffs will represent the average of existing rates. Hence, in some instances they will be lower and in some, higher than those in effect in the several countries before the establishment of the common market.

equivalent to the American domestic market. Within this huge market area greater product specialization and larger, more efficient producing units will develop as the mutual trade barriers are reduced to zero. It will be difficult for outside producers to compete in the common market area, since they will not enjoy the benefit of the reduced tariffs, but in addition, common market producers, strengthened by freer competition at home, will undoubtedly be stronger competitors in outside markets as well (including the domestic U. S. market).

The recent currency moves are a sign of the growing economic strength of Europe. In an interview of Per Jacobsson, Managing Director of the International Monetary Fund, by *U. S. News and World Report* (January 9, 1959), he was asked the following question: "Would you say that these moves, the common market and currency stabilization, are a sign that Europe now feels more able to compete on equal terms with the United States?" His answer: "Certainly. I think one may also put it in this way: That, for several years after the war, when the United States was the only country that could deliver speedily all kinds of goods, people bought from the United States a number of articles that they normally would have produced themselves or bought from each other. That time has now gone."

On the other hand, the currency moves in Europe make possible external convertibility of profits, so American businessmen have a greater incentive to invest abroad. In addition, an American company can market anywhere in the common market area if it has

an established facility in that area. In this instance he enjoys the advantages of the lower wages and tariffs but, of course, labors under whatever cost and operating disadvantages there may be also. The whole question is whether or not there is a *net* advantage.

What Are the Alternatives?

Mr. Ernest Breech, chairman of the Ford Motor Company, summed up his view of the alternatives available to American producers threatened by manufacturers in the low-wage countries (*U. S. News and World Report*, December 19, 1958: (1) More protection through tariffs, etc., (2) Establish manufacturing facilities abroad, (3) Focus on reductions of cost at home in order to equate more nearly the foreign advantage in wages. The first alternative he discounts as being a poor long-run solution. American producers must compete. Tariff walls are not the answer. Mr. Breech feels that the third alternative is a good one, but does not see how it can be done in the magnitudes required. This leaves the second alternative, manufacturing abroad.

This panacea is being echoed across the nation. For example, Mr. Robert Erickson, Executive Vice-President, Beckman Instruments, Inc., Fullerton, California, said in an address before a group of industrial engineers and managers (11th Annual Industrial Engineering Institute, February 6 and 7, UCLA and UCB): "It is becoming necessary, if we wish to compete in markets outside of the United States, to have our products made in our plants in Germany and the United Kingdom."

The Real Labor Costs

For a particular manufacturer the important question is, *is there a net advantage to him?*² There are several important reasons why there may not be. The great attraction in establishing foreign manufacturing operations is apparently low wages. Every article and speech quoted above emphasizes this point. But actually, wage levels themselves are not the important parameter. *Labor costs*

will determine the advantage or disadvantage. Indeed, the American manufacturer knows better than any other perhaps that wages can be high and labor costs low simultaneously. The equating factor is productivity. The American worker is paid a great deal more per hour, but through the relatively large capital investment behind him, his efforts are multiplied through tools, mechanization, and automation. The appropriate yardstick for the manufacturer is not differences in hourly wages but differences, if any, in unit labor costs.

Can a manufacturer have the advantage of lower wages with high productivity by using the same levels of mechanization and managerial practice abroad as he does at home? Well, perhaps, but we must note the difference in basic production economics here and abroad. Since labor is cheap relative to equipment abroad, the manufacturer may find it wise to use relatively more labor and less expensive machinery with resulting productivity and final labor costs more in line with that achieved by his foreign counterpart. The most economical manufacturing methods in techniques are not necessarily always those with the greatest possible mechanization, but those which for a given situation strike a balance between the costs of labor and the costs of machinery.

Can a net advantage in labor costs be offset by net disadvantages in other costs? Assume for a moment that a particular manufacturer will have a net labor cost advantage through foreign manufacture. Will items of cost such as materials, fuel and power, equipment, the cost of credit, and others partially or completely counterbalance the labor cost advantage? We think that the answer is different for different organizations and product lines. There is no one answer. The components of labor, materials and capital in different products varies considerably. In the petroleum industry labor costs are low, perhaps 5 per cent, while material and capital are very much more important. For the turbo generator cited in the opening paragraph, the proportion of the total which was labor

cost was undoubtedly very high because this kind of equipment is custom built to specifications.

The result of the above discussion of net advantage or disadvantage of all costs indicates that a company could be burned badly by rushing to low wage areas in foreign countries unless low wages translates into *low labor costs* for *their* products and that this labor cost advantage will not be erased by higher material, energy and equipment costs. On the other hand, companies with a cost distribution that fits might be missing a real opportunity if they did not manufacture abroad.

In the following sections of this paper we shall bring together and analyze the best data available on these cost factors in an attempt to see where cost advantages of foreign manufacture exists and where they do not exist. We shall organize the discussion under the headings of Wage Level Comparisons; Labor Costs; Energy, Other Manufacturing Costs; Material, Labor, and Capital Content of Various Products; and Final Comparisons of Total Manufacturing Costs by Countries and by Products.

Wage Level Comparisons

It is important to note that the wage paid in many European countries often drastically understates the cost to the employer for an hour of work. The reason is that the so-called "social charges" (social security, workmen's compensation, vacations, etc.) are somewhat larger, proportionally, than usual in the United States. Particularly in countries like Western Germany, France, and Italy, the social charges are very large. Table II shows the results of a comparative study of the amount of social charges in various countries for 1956.

When these costs are taken into account, the relative wages in the several countries appear as in Table III, for the year 1956.

Including social charges, then, average wages in Europe ranged from 17 per cent to about 39 per cent of those in the United States for the year 1956. Of course there

TABLE II

TOTAL SOCIAL CHARGES IN PER CENT OF THE
HOURLY WAGES FOR 1956
FOR VARIOUS COUNTRIES*

Western Germany.....	41.0%
Belgium.....	29.4
France.....	41.85
Italy.....	63.5
Low Countries.....	28.6
United Kingdom.....	8.4
Sweden.....	15.3
Switzerland.....	15.4
U.S.....	20.0

* Source: A. Devaux, "L'Évolution des Charges Sociales et des Coûts de Main-d'œuvre en Europe Occidentale et aux États-Unis," *Études et Conjoncture*, August, 1957, p. 880.

TABLE III

COST OF AN HOUR OF WORK IN 1956
IN VARIOUS COUNTRIES
(U.S. = 100)

United States.....	100
Sweden.....	38.8
France.....	29.1
Switzerland.....	28.6
Belgium.....	27.7
United Kingdom.....	27.1
West Germany.....	25.9
Italy.....	21.9
Low Countries.....	16.9

Source: A. Devaux, *Études et Conjoncture*.

have been wage increases in all of these countries since 1956.

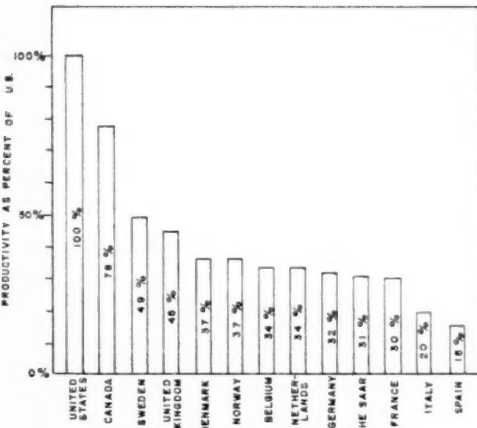
These are average figures for the various countries, but they are very much in line with those quoted by the article, "26 Cents an Hour vs. \$2.10," reported at the beginning of this paper. But what about labor cost? Do low wages translate directly into low labor cost, or does the advantage disappear when productivity is taken into account?

Labor Cost Comparisons

Good data on labor cost is very difficult to obtain for obvious reasons. Relative productivity figures are available from special studies, but not necessarily for the same years as the wage data, including social charges, given above.

We should point out that national productivity figures depend to a considerable extent on the product mix, i.e., on the relative importance of high and low productivity industries within the country. Where there is a preponderance of essentially handicraft or artisan enterprises, the average level is strongly weighted by them. Also the mix of plant sizes becomes a factor. Figure I shows the productivity in manufacturing for Canada, Western European countries and the United States, all expressed as a per cent of the U. S. productivity figures. It is obvious that while the wage paid the U. S. worker is very much higher compared to the Western European countries, the resulting labor cost in the product cannot compare as unfavorably as the raw wage data indicates.

FIGURE I
RELATIVE PRODUCTIVITY PER WORKER IN MANUFACTURING
— 1950



From F. W. Dresch, *Productivity in Manufacturing*, Stanford Research Institute, 1953

The relative wage data is for 1956 and the relative productivity data is for 1950. Assuming that the relative positions of the various countries have not changed greatly in the intervening years, we can adjust the wage data relatives to obtain a general index of average labor cost by dividing the wage data indexes by the productivity indexes for each country for which we have data. The result shown in Table IV gives an index of average labor cost compared to the United States.

TABLE IV
GENERAL INDEX OF LABOR COST INDEXES OF
TABLE III ADJUSTED BY THE PRODUCTIVITY
INDEXES OF FIGURE I
(U.S. = 100)

United States.....	109
Sweden.....	70
France.....	97
Belgium.....	82
United Kingdom.....	60
West Germany.....	81
Italy.....	110
Low Countries.....	50

It would be dangerous to attach very strict interpretations to the series for a particular manufacturer because there are differences in wages paid by industry and perhaps more important, the difference in productivity by industry compared to the United States is marked, as we shall see later. Nevertheless, with all of the faults that one might find with the data, it gives the general indication that labor costs are much more in line with U. S. labor costs than the wage data itself would indicate. Indeed, in the case of France² and Italy they may not be far different.

For the steel industry, we have two interesting comparisons between American and West German productivity. A German study³ reports that the range of man-hours of work input per ton of steel for the U. S. and West Germany is:

United States—4.5–7.5 man-hours per ton
West Germany—9–30 man-hours per ton.

Here we see the U. S. range is entirely below the minimum German figure. Taking the figure of 5 as representative of the U. S. and 20 as representative of West Germany, the ratio of productivity seems to be about 4 to 1 in favor of the U. S.

Another study compared two specific steel plants, the Indiana Harbor Works of the In-

² This of course does not reflect the recent devaluation of the franc.

³ W. Schulte, "Betriebswirtschaftliche Beobachtungen in Amerikanischen Huettenwerken ueber Arbeitsweise und Arbeitseffekt," *Stahl und Eisen*, No. 13, June 26, 1958.

land Steel Company, East Chicago, Indiana, and the Dortmund-Hörde Huttenunion of Dortmund, Germany.⁴ The American plant employed a total of slightly more than 18,000 people and the German plant employed slightly over 17,000 people. However, the steel-making capability of the American plant was 5 million tons per year and of the German plant 2.5 million tons. A 2 to 1 ratio. Obviously, wage rates are a poor measure of labor cost.

Average wage and productivity figures can be misleading because, of course, there is always variation such that the averages may mask the effect of one or more highly competitive producers. This point is brought out by a study of the French shoe industry.⁵ Abstracting from the study a comparison for one type of shoe, the wages paid, and the annual output per direct worker, we arrive at Table V. Note that Company 101 is pay-

ing below average wages but in addition is the outstanding producer in the industry, here basic productivity being 2.5 times the average and 46 per cent more than the next most productive company, No. 103.

Company 101 has the capability to be a very formidable competitor in markets foreign to France. Fixed costs can very likely be more than covered by the company's domestic market, and in foreign markets, the company can resort to marginal costing to compete on at least equal price terms with other producers in those markets.

British vs. U. S. Productivity

There is a study of productivity by industry in England which is more revealing as to details. Table VI gives the ratios of wages, productivity and unit labor cost for a number of major industry groups in England and America. The table immediately shows the danger of dealing with average country figures for productivity, wages and labor cost. The wage ratio range is fairly small, from 2.70 for cement to 4.77 for metal cans. However, output per worker ratios range from 1.11 in the shipbuilding and repairing industry to 5.61 for metal cans. Since a worker produces 5.61 times as many metal cans in the American plant as in the average British plant, average British wages could be less than 20 per cent of the U. S. wages for the metal can industry while average *labor costs* in a unit of product would be about equal.

On the other hand, in the cement industry or in shipbuilding, the situation would be just the reverse, since a difference in actual wage fairly well translates into a difference in labor cost in the product between the two countries. The unit labor cost column of Table VI tells the important story. It is essentially the wage ratio column divided by the productivity column. Here we see that many U. S. industries are at a labor cost disadvantage. However, if U. S. companies in steel, electronic tubes, radios, autos, and many others, were to go to England to obtain the benefits of low wages, they would be in for a great shock. *Metal cans* present the ex-

TABLE V

Company Code Number	Average Hourly Wages—Franks	Annual Output in Pairs of Shoes per Direct Worker
2.....	...	760
4.....	...	1120
10.....	145	1320
101.....	113	2570
103.....	...	1760
111.....	120	500
118.....	113	1400
120.....	141	720
132.....	103	1280
135.....	109	560
136.....	...	610
137.....	...	1000
138.....	...	....
139.....	148	900
151.....	126	1080
155.....	116	1060
161.....	125	1070
163.....	125	490
167.....	113	1290
Average.....	123	1080

⁴F. H. Habrison, E. Köchling, F. H. Cassell, H. C. Ruebmann, "Steel Management on Two Continents," *Management Science*, Oct., 1955, Vol. 2, No. 1.

⁵Industrie de la Chaussure, Centre D'Etudes et de Mesures de Productivité, 1954-55.

TABLE VI
COMPARISON OF WAGE RATIOS, OUTPUT PER WORKER AND RELATIVE UNIT LABOR COSTS
FOR 44 SELECTED INDUSTRIES IN 1950

Industry	Ratio U.S. to United Kingdom		
	Wage ratio	Output per worker ratio	Unit labor cost ratio
1. Shipbuilding and repairing	3.21	1.11	2.89
2. Cement	2.70	1.16	2.33
3. Sugar factories and refineries	2.79	1.48	1.89
4. Tanneries	3.23	1.68	1.92
5. Outerwear and underwear	3.63	1.70	2.14
6. Footwear, except rubber	2.88	1.71	1.68
7. Grain mill products	3.14	1.83	1.72
8. Woolen and worsted	3.63	1.85	1.97
9. Knitting mills	3.27	1.87	1.75
10. Tools and implements	3.72	1.90	1.96
11. Cutlery	3.38	1.93	1.75
12. Structural clay products	2.88	1.97	1.46
13. Iron and steel foundries	3.32	2.02	1.64
14. Ball and roller bearings	3.53	2.08	1.70
15. Metal-working machinery	3.96	2.21	1.79
16. Rayon, nylon and silk	3.42	2.26	1.52
17. Canning and preserving of fruits and vegetables	3.19	2.35	1.36
18. Generators, motors and transformers	3.57	2.39	1.49
19. Tires and tubes	3.63	2.41	1.50
20. Wirework	3.72	2.44	1.52
21. Soap, candles and glycerine	3.93	2.49	1.58
22. Cotton spinning and weaving	3.31	2.49	1.33
23. Rubber products, except tires and tubes	3.62	2.50	1.45
24. Tobacco manufactures	2.58	2.51	1.04
25. Linoleum and leathercloth	3.25	2.56	1.27
26. Bolts, nuts, rivets, screws	4.37	2.56	1.71
27. Steel works and rolling mills	3.14	2.69	1.17
28. Glass containers	3.23	2.74	1.18
29. Breweries and manufacturing of malt	4.00	3.00	1.33
30. Pulp, paper and board	3.65	3.38	1.08
31. Wire drawing	3.42	3.39	1.01
32. Electronic tubes	3.91	3.55	1.10
33. Electric light bulbs	3.93	3.56	1.10
34. Paint and varnish	3.50	3.63	0.96
35. Basic industrial chemicals	3.38	3.72	0.91
36. Matches	3.77	3.76	1.00
37. Radio	3.39	4.00	0.85
38. Blast furnaces	2.96	4.08	0.73
39. Storage batteries	3.26	4.11	0.79
40. Electrical household equipment	3.95	4.12	0.96
41. Containers, paper and card	4.09	4.28	0.96
42. Agricultural machinery except tractors	3.42	4.29	0.80
43. Automobiles, trucks and tractors	3.37	4.66	0.72
44. Metal cans	4.77	5.61	0.85

Source: Adapted from D. Paige and G. Bombach, *A Comparison of National Output and Productivity of the United Kingdom and the United States*, Organization for European Economic Cooperation, Paris, 1959, p. 64.

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Food and I
Pulp, Pape
Chemicals
Rubber Pr
Fabricated
Machinery
Electrical
Instrument
All Other

Source: C

treme example from Table VI. U. S. can companies pay nearly 5 times the hourly wages, yet because of a fantastic productivity edge, their labor costs are only 85 per cent of those in the United Kingdom.

As an extreme example from the same study, output per worker in the American fuel industries was 700 per cent to 860 per cent of that in the United Kingdom. This difference in productivity is considered to be primarily due to the vast differences in the natural resources of the two countries, but nevertheless fuel is an important cost to many industries and it is comparatively high in most European countries.

How do we explain these differences in productivity? Output per worker in the U. S. averages about 2½ times that in England, but while we commonly express these figures based on labor input, we cannot judge the productive factor in industry by the labor factor per se. Rather, it is the man-machine unit or the labor-capital combination which is controlling. The Paige-Bombach study summarizes this point, "...owing to the various technological and natural resource differences referred to above, the combination of capital and labour employed in the United States has a higher productivity than the combination of capital and labour used in Britain."

Comparison of Production Costs

The National Industrial Conference Board has made a special study* of production costs among member companies that have both domestic and foreign operations. The data was obtained by means of a questionnaire which asked for the percentage breakdown for both domestic and foreign operations of total unit cost between labor, material, and overhead on products that were basically similar. With this data plus ratios of total unit costs, it was possible to tabulate relative figures on the three classifications of cost.

We may take exception to this study in some ways. Since the study deals only with American companies having both domestic and foreign operations on similar products, we may wonder how similar were the products reported on. Also, the method of reporting only ratio leaves much to be desired. Nevertheless, the study adds an important segment of data to be examined. Our interest now is in the labor cost figures by industry which are shown in Table VII.

Table VII shows that labor costs were reported as lower in foreign countries for a majority of the products (76 per cent). In that group, over half of the products are re-

* "Production Costs Here and Abroad," *National Industrial Conference Board, Studies in Business Economics*, No. 61, 1958.

TABLE VII
DISTRIBUTION OF RATIOS OF FOREIGN TO DOMESTIC LABOR COSTS BY INDUSTRY

	Labor Cost Less than U.S.	Same as U.S.	Labor Cost More than U.S.
Food and Kindred Products.....	20	2	3
Pulp, Paper and Products.....	4	2	3
Chemicals and Allied Products.....	37	5	16
Rubber Products.....	10	0	0
Fabricated Metal Products.....	20	0	1
Machinery except Electrical.....	12	0	5
Electrical Machinery.....	12	0	0
Instruments and Related Products.....	5	0	2
All Other.....	16	3	1
	136	12	31

Source: Conference Board Report.

ported as "less than 55 per cent of domestic labor costs." Here we see that it is only pulp and paper industry, the chemical industry, and the machinery industry that show any large proportion of products in the higher cost category.

As a general conclusion on labor cost, it appears that foreign labor costs are lower on the average; however, there is considerable variability. For 26 per cent of the products studied, foreign labor costs were the same or higher than domestic. For 10 per cent foreign labor costs were more than 45 per cent greater than domestic costs. This is a far different picture than one might expect by simply determining the *wage-rate* differentials. The balancing factor seems to be productivity. (See Table III, IV, V, VI, and Figure I).

Other Manufacturing Costs

Materials, of course, are ordinarily the other component of costs which are direct and im-

portant in the final cost of the product. Table VIII shows a comparison of the costs some items of basic raw materials. The data is incomplete, but it does indicate that United States prices of pig iron and steel are low except in comparison to the United Kingdom. The United Kingdom is also somewhat lower for copper, lead, and zinc. Of course, "materials" in manufacturing are represented by a wide variety of raw materials and finished and semi-finished products, and to compare prices for a valid sample of them would be difficult. Here the Conference Board study of production costs furnishes some valuable information, for without the necessity of making a large number of intercomparisons of individual materials, we have the reports to examine of the companies with operations both here and abroad. Table IX shows the summary for the distribution of material costs for that study.

Table IX shows that only 29.9 per cent of

TABLE VIII
PRICES IN DOLLARS FOR DIFFERENT RAW MATERIALS BY COUNTRY FOR THE YEAR 1956
(first three quarters)

Country	Pig Iron (Long Ton)	Scrap Iron (Long Ton)	Steel (Long Ton)	Copper	Lead (100 lbs)	Zinc
United States	60.06	50.80	88.50	43.70	16.00	14.02
United Kingdom.....	49.80	26.90	78.50	42.40	14.54	12.09
Germany.....	71.30	.....	95.74	.....	.....	.....
France.....	.....	.....	111.40	.....	.....	.....
Belgium.....	65.30	.....	109.00	.....	.....	.....

Source: OEEC Statistical Bulletin, 1957.

TABLE IX
DISTRIBUTION OF RATIOS OF FOREIGN TO DOMESTIC MATERIAL COSTS BY INDUSTRY FOR 181 PRODUCTS

Industry	Material Cost Less than U.S.	Same as U.S.	Material Cost Higher than U.S.
Food and Kindred Products.....	7	8	10
Pulp, Paper and Products.....	1	1	7
Chemicals and Allied Products.....	12	11	35
Rubber Products.....	4	0	6
Fabricated Metal Products.....	7	2	12
Machinery except Electrical.....	6	2	9
Electrical Machinery.....	2	2	8
Instruments and Related Products.....	2	0	5
Other Products.....	13	1	8
Totals.....	54	27	100

Source: Conference Board Report.

the products were reported with material costs lower in foreign countries, and 70.1 per cent were either equal or higher. This indicates a pattern that is somewhat the reverse of that of the labor cost picture. Thus the company in an industry where the labor component was relatively large and the material component relatively small might find an advantageous balance of costs abroad. On the other hand, the reverse pattern might be true for a company in which material costs were large. We see that not only were material costs higher on the average in foreign countries, but for *each* industry listed there was a greater frequency of reporting of higher material costs in foreign plants than there was of lower costs.

In the general category of overhead costs there are such a variety of items that generalizations are difficult. Some of them may

be lower and some higher than would be typical of American plants. The labor component of overhead costs we would expect to be generally lower, in line with the generally lower wage rates. Capital costs in Europe are somewhat higher. The European manufacturer must pay 7-10 per cent per year for borrowed money while many large U. S. corporations pay as little as 3 or 4 per cent. The cost of the equipment itself may be higher or lower.

Fuel and other sources of industrial energy are significant costs for some industries. Here again, it appears that foreign costs are not attractive. Table X shows the cost of fuel relative to the cost of labor for the United States and Great Britain. The conclusion indicated here is that while wage rates are low in Great Britain, energy cost is very high compared to the U. S.

TABLE X

RATIO OF FUEL COST TO AVERAGE WAGE RATES
IN THE U. S. AND GREAT BRITAIN FOR 1948
(U.S. = 100)

Fuel	U.S.	Great Britain
Coal.....	100	535
Oil.....	100	454
Gasoline.....	100	760
Manufactured Gas.....	100	335
Natural Gas (U.S. vs. manufactured gas).....	100	1,584
Electricity.....	100	283

Source: M. Frankel, *British and American Manufacturing Productivity*, University of Illinois, 1957.

Material, Labor and Overhead

The position of a given company can be evaluated better when we know whether it is one that requires a relatively large labor component and a small material component, etc. Table XI summarizes the distribution of these major costs for the companies that participated in the Conference Board study. This table gives the distribution of the average production cost dollar by industry for both the United States operations and the foreign operations.

Table XI shows the over-all effect of the generally lower labor costs and the generally

TABLE XI

DISTRIBUTION OF AVERAGE PRODUCT COSTS BY INDUSTRY FOR U.S. AND FOREIGN OPERATIONS

Industry	Labor		Material		Total Overhead	
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
Food and Kindred Products.....	12.4%	6.5%	69.5%	77.1%	18.1%	16.5%
Pulp, Paper and Products.....	15.0	9.1	61.8	76.4	23.2	14.5
Chemical and Allied Products.....	10.6	6.4	68.1	74.8	21.3	18.8
Rubber Products.....	22.5	12.6	47.2	55.9	30.4	31.5
Fabricated Metal Products.....	17.4	11.8	47.2	59.2	35.5	29.0
Machinery except Electrical.....	21.9	14.6	39.7	48.6	38.4	36.7
Electrical Machinery.....	23.2	13.9	41.7	64.0	35.1	22.1
Instruments and Related Products....	20.7	11.7	44.0	56.5	35.3	31.8

Source: Conference Board Report.

TABLE XII
DISTRIBUTION OF RATIOS OF FOREIGN TO DOMESTIC UNIT COSTS BY INDUSTRY FOR 192 PRODUCTS

Industry	Unit Cost Lower	Unit Cost Same	Unit Cost Higher
Food and Kindred Products.....	7	8	10
Pulp, Paper and Products.....	3	0	6
Chemical and Allied Products.....	17	11	30
Rubber Products.....	4	2	4
Fabricated Metal Products.....	13	4	4
Machinery except Electrical.....	12	5	4
Electrical Machinery.....	6	5	2
Instruments and Related Products.....	4	0	5
Other.....	19	2	5
Totals.....	85	37	70

Source: Conference Board Report.

higher material costs. For the foreign operation, the proportion of labor cost in the product has declined and in the material sector increased for every industry. What was the effect on total production cost?

Overall Production Costs

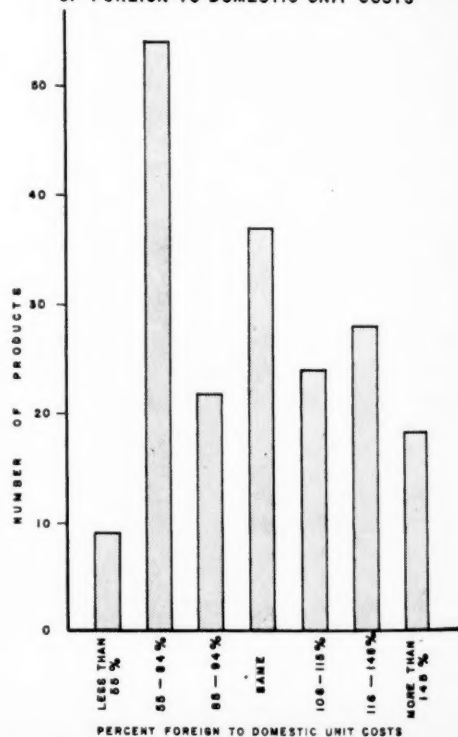
The Conference Board study summarizing the total cost ratios of foreign to domestic costs is given in Table XII.

Of the 192 products on which total unit cost ratios were given, 44.2 per cent were below U. S. costs, 19.3 per cent equal to U. S. costs, and 36½ per cent were greater than U. S. costs. When all costs are considered, there is no picture of either generally lower or generally higher costs abroad. On the other hand, what is indicated is a picture of considerable variability, ranging from foreign costs of less than 55 per cent of domestic to foreign costs of more than 145 per cent of domestic costs. (See Figure II.) Apparently there are some products, industries or companies that are favored by the structure of foreign costs and others where the conditions are unfavorable. Table XI indicates that the industries that have a relatively low labor content and high material content are the first three: food, pulp and paper, and chemicals. Reference to Table XII shows that products in these industries are the ones that

predominate the "unit cost higher" column. Similarly, those industries that have the reverse pattern of labor and material cost, that

FIGURE II

DISTRIBUTION OF NUMBER OF PRODUCTS BY RATIO OF FOREIGN TO DOMESTIC UNIT COSTS



is, rubber, fabricated metal, and machinery, are the ones that predominate in the "unit cost lower" column of Table XII.

Productivity: the Key to U. S. Market Defense

It does not appear logical that low wage rates in foreign countries generally threaten United States industry. It is true that foreign companies have an advantage in certain product lines, but on the other hand, American companies have an advantage in other product lines.

The most powerful defense against the low wage rate appears to be the great advantage in productivity enjoyed by America. The American lead here is significant, but not equally so in all industries. While the European countries are increasing their productivity, so is the United States.

Assuming that the average productivity index of Western Europe in 1959 is about 40 per cent of the American level, and that the growth in Western Europe can continue at a rate of 5 per cent as against a rate of 3 per cent in the United States, we would have the following comparison for 10, 15, 20 and 25 years hence.

Year	U. S.	Western Europe	Ratio
1969	134	65	2.06:1
1974	156	83	1.88:1
1979	181	106	1.76:1
1984	209	136	1.54:1

Hence, even at the assumed high rate of productivity growth in Western Europe, there is little chance that European productivity could catch up with U. S. Even if this pattern should take place, European wage levels would undoubtedly rise with their increases in productivity, so that from an overall competitive viewpoint, actual labor-cost ratios between Europe and U. S. might not vary a great deal in the aggregate. Individual industries, however, cannot hide behind the average figures for, as we have seen, there is great variation in productivity between industries for a given country. Finally, the other important counterbalancing factor is material cost. These costs can wipe out an advantage in labor costs. Each company in each industry must make decisions about foreign production based upon the balance of cost factors that they experience.

The fine art of executive decision consists in not deciding questions that are not pertinent, in not deciding prematurely, in not making decisions that cannot be effective, and in not making decisions that others should make.

C. I. Barnard

Internationalism: A New Concept for U. S. Business

JOHN J. BEAUVOIS

A mandatory organizational and philosophical concept for tomorrow's international businesses and international business managers.

Within the next ten or fifteen years the physiognomy of American business is likely to change dramatically as a large number of American companies emerge, by choice or by necessity, as international enterprises. Barring a world war, this change appears inevitable in the light of current trends. Indeed it is confirmed by unmistakable precursory signs.

One decade ago the pre-eminent position of United States business in the world was uncontested. As a consequence of the war, the dominating role in world trade seemed indisputably to have been awarded to the United States. It appeared quite unlikely that the convalescing economies of Western Europe would ever be a threat to American business.

Today, not only is the position of United States business threatened overseas, but foreign competition has become a significant factor in the domestic market as well. The damage to domestic industries from foreign enterprises is readily illustrated by import statistics for a growing list of products—office equipment, transistor radios, machine tools, steel, brass—products of high and low labor content, of high and low unit value.

Thus, many competitive forces gathering strength in every part of the world are directly affecting a broad array of United States enterprises. That these forces will recede is unlikely. On the contrary, they are likely to gain in intensity as the productive capacity of the world increases. By every

indication, United States business is entering an era of intense competition to which it is becoming increasingly vulnerable.

Currently, and as an additional stimulus to international competition, business opportunities are rapidly increasing the world over. In many countries the rate of economic growth is faster than in the United States, profit opportunities are greater, and the degree of market penetration and saturation are much lower.

Mass markets are emerging in Europe. Even the most economically backward areas of the world are embarking on programs to meet basic national and individual needs, and this with a great sense of urgency. A good example is the African continent and some of its newest countries, Nigeria and Ghana.

Faced by these two concurrent developments, United States companies are not remaining passive. Many companies already heavily committed abroad will continue to expand their international activity to seize overseas opportunities. Others are looking abroad for lower cost production sources in order to compete in domestic markets.

Even more significant, perhaps, a large number of now purely domestic companies will move into the international field for defensive, if not offensive, reasons.

American Business Internationalized

These trends will inevitably accelerate the "internationalization" of American business.

As a result, 10 or 15 years hence, the next generation of management will most likely operate in an entirely new perspective—that of a world-wide enterprise.

As the geographical scope of a firm's activity increases to world-wide dimensions, the nature and magnitude of management's problems will inevitably change. Managing a company in a global perspective creates a variety of problems, some familiar—but compounded by the complexities of international operation—and some wholly new.

Magnitude of Management Problems

The problems already familiar to management are complicated by the inescapable intricacies of international business. There are barriers of time, distance, language. There are countless legal and procedural details. There are shifts in international relations, changes in quota restrictions, and political and social movements all of which may profoundly affect the company and yet many of which may seem puzzling to a foreign observer.

The net effect of these complications is to make more difficult most of the ordinary functions of domestic business.

New problems, foreign to a purely domestic operation, are also raised. These problems stem primarily from the political, economic, and business structures in various countries. For instance, the management of cash flow on a world-wide basis is a difficult yet critical aspect of international management that has no equivalent domestically.

Thus, as an increasing number of American companies become international enterprises, their management will be faced by problems of a new magnitude. Much of the next generation of management will operate in a world-wide perspective in which the conditions of success will differ from those of today.

Because we are in a transition period, and because one of the characteristics of our times is the dramatic acceleration of events in the pace of history, this is the opportune time to reappraise our business

thinking. It is the purpose of this article to set forth the business philosophy, organizational tools, and managerial skills which may well be required by a significant segment of the business world of the 1970's.

A New Business Philosophy

Every business era tests the businessman's ability to adjust to new conditions and thereby gauges his chances of success. The European merchant of the Sixteenth Century could no more afford to ignore the discovery of the New World than could his counterpart today overlook the emergence of the Common Market.

Likewise, if the next generation of American management is to operate successfully on a world-wide basis, it cannot afford to limit its interest or thinking to the continental United States; it cannot afford to give priority in its thinking to any area of the world unless justified by facts. Faced with problems of a world-wide magnitude, the next generation will drop national boundaries from its business thinking.

Rejecting all parochialism, these executives will consider the whole world as a potential market and production center, an available source of ideas, a pool of skills. As a result, world alternatives will be an intrinsic part of the corporate planning process and not a supplementary, or even accessory, activity.

The deployment of personnel, investment of corporate resources, the utilization of technical facilities, and the development of long-range marketing strategies will all be determined in the light of the alternative opportunities available to the company in various parts of the world.

That this global view radically departs from the traditional, domestically oriented business philosophy is evident. Yet, the adaption of this view will essentially determine the ability of management to cope successfully with the business problems of tomorrow.

No matter how well accepted by management, this world-wide view will be a com-

petitive asset only insofar as it can be readily translated into corporate activity. In this respect it appears that the traditional segregation as illustrated in Figure I between "domestic" and "international" activities in business organizations is a serious obstacle. This condition is only natural, for the segregated form of organization stems from a segregated view of the business world in which top management's interests and thoughts are strongly oriented toward the domestic market.

In practice, this segregated organization permits "international specialists" to make fundamental decisions that have company-wide implications and that should accordingly be made by corporate executives. Furthermore, it often leads to the distribution of corporate efforts, skills, and investments on the basis of geographical preference rather than on the basis of the best corporate interest.

Thus, although a segregated form of organization may have served its purpose when United States products enjoyed a quasi-monopoly overseas, and may still be satisfactory for companies with little or no international activity, it cannot provide the next generation of management with the tools required in a highly competitive world economy.

As American companies develop into "international enterprises" they will need a new concept of organization which will remove top management from its structural isolation from the outside world. This essentially means that:

1. Corporate management must plan, coordinate, and control all corporate activities on a world-wide basis, instead of being predominantly concerned with serving the United States market and delegating the rest of the world to an international division.
2. Divisional management (top and middle) will also retain international responsibilities, perhaps through implementation and execution of corporate policies on a divisional basis, with responsibility assigned by

geographic area—e.g., United States, United Kingdom, Commonwealth, Europe. These divisions would, of course, vary in size and importance according to their contribution to corporate sales and profits.

Organizational integration as illustrated in Figure II provides the structural framework within which such functions of management can be effectively performed.

Organizational Segregation: Obsolescent Concept

"Segregation" as an organizational concept will not, in my opinion, meet the requirements of the next generation of management. This proposition can be illustrated by a few instances drawn from current experiences. And the significance of these examples will be greatly enhanced for a company operating in the 1970's.

- Because segregation isolates top management organizationally from the international world, it may result in the failure to examine sound and attractive alternatives abroad.

Two years ago a large, highly diversified corporation liquidated one of its principal divisions. That division manufactured an industrial component, and had shown substantial, increasing losses. Its production costs had risen sharply. Prices were declining. Many large customers were integrating backwards, and the outlook was for even greater future losses. The liquidation of the division had an immediate and favorable effect on over-all corporate profit. But it also required that the corporation disperse a highly skilled and experienced group of scientists and technicians.

Without exception, the circumstances that had produced a substantial loss in the division's operations existed only in the United States market. At the very time of liquidation, other companies were establishing similar facilities in Europe.

The corporation is now considering its own expansion into European activities

and weighing the desirability of trying to re-establish there the skills and facilities that it gave up only recently.

- Segregation makes difficult a world-wide coordination of corporate activities.

Some years ago a leading manufacturer of consumer durable goods established an operation in Europe to serve all world markets outside North America. The European operation flourished. It developed its own product line, gradually diverging from the product line of the parent corporation, so that recently the European subsidiary was deriving half its volume from products that were not manufactured in the United States Organization.

The head of the overseas operation reported directly, and infrequently, to the chief executive of the parent corporation. No organizational provision whatever was made for coordinating product development, production methods, marketing, or pricing. In effect, the American company continued to operate entirely as a domestic enterprise and to treat its substantial commitments abroad solely as an investment.

- Segregation, because it makes long-range planning on a world-wide basis difficult, can lead to unsound, expedient decisions that eventually backfire to the detriment of the entire corporation.

Some years ago the producer of a complex industrial product had achieved such a commanding share of the American market that any further increase was quite unlikely. At the time, foreign markets were very small and did not appear to warrant the establishment of overseas facilities. There was, however, the opportunity to augment current income through a licensing arrangement, and the company licensed a small manufacturer in Europe. The European licensee has grown and today is the licensor's most formidable competitor in the world market.

Other instances of how segregation hurts American business could be cited. The fact

is that segregation has already become a business liability for some companies, even though we now have only a foretaste of the intense competition and tremendous opportunities that will mark the business world of the 1970's. There is every evidence that the segregated form of company organization will not meet the needs of management 10 or 15 years from now.

Integration: An Up-to-date Concept

Because it reflects a world-wide view and permits its translation into business practices, organizational integration will be an up-to-date concept in the 1970's. Although there are several intermediate stages between organizational segregation and integration, we shall be concerned here only with the ultimate result: the integrated international organization, and with the functions of corporate and divisional management.

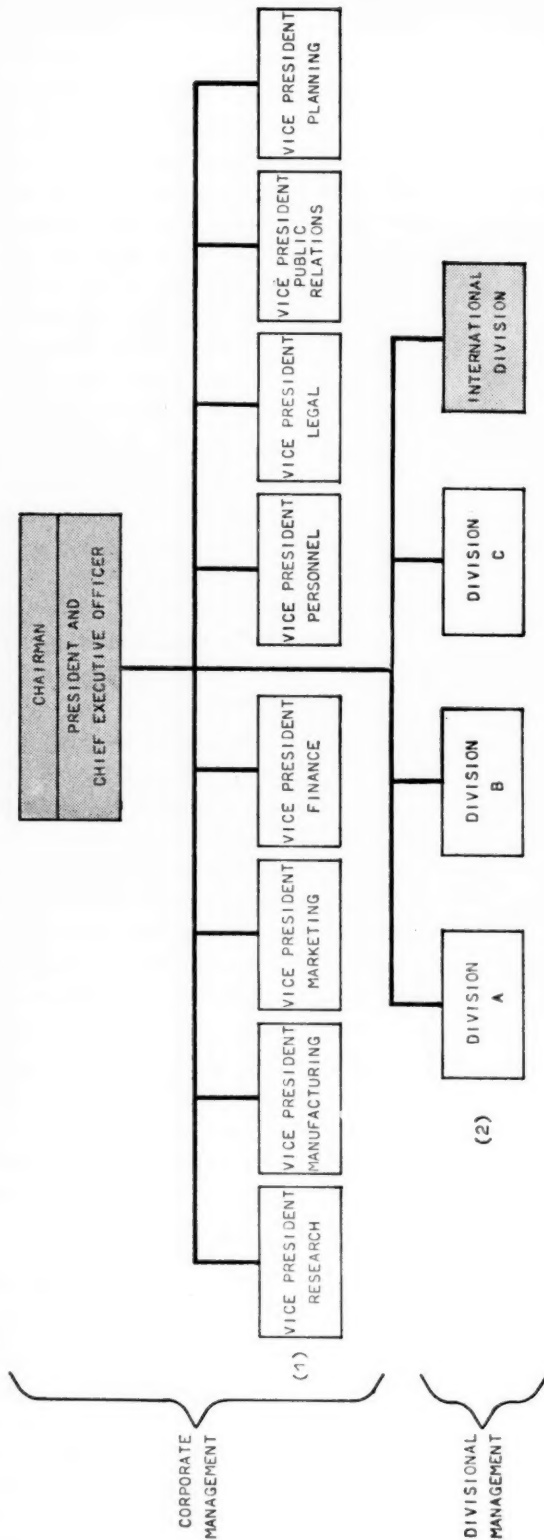
An integrated organization (see Figure II) is characterized by three main levels of management. First, the corporate level, composed of the chief executive officer, the president, and the corporate vice presidents—all with world-wide responsibilities. Second, the divisional level, composed of division heads (presidents and vice presidents), the functional vice presidents, and their staff—each division responsible for a particular geographical area, e.g., United States, Europe. And third, the operational level, composed of the operative units (branches, subsidiaries, etc.) and their management groups—each unit under the supervision of a division and responsible for one country or marketing area, e.g., Germany, Brazil, Benelux.

The Role of Corporate Management

A number of variations are possible in the practical application of organizational integration. For instance, a company's particular needs may require, without defiance of the basic concept, that Research, Advertising, or Personnel be centralized rather than handled on a divisional basis.

In any case, the cardinal principle remains: top management should exercise its

FIGURE 1 BASIC STRUCTURE OF A SEGREGATED ORGANIZATION



EXECUTIVES WITH WORLD-WIDE RESPONSIBILITY; THAT IS, THEY ARE RESPONSIBLE FOR INTERNATIONAL ACTIVITIES AS WELL AS FOR DOMESTIC ACTIVITIES IN THE UNITED STATES AND ALL OTHER COUNTRIES.

EXECUTIVES WITH INTERNATIONAL (BUT NOT WORLD-WIDE) RESPONSIBILITY; THAT IS, THEY ARE RESPONSIBLE FOR ACTIVITIES INVOLVING MORE THAN ONE COUNTRY, BUT NOT THE ENTIRE WORLD.

CORPORATE EXECUTIVES WITH FUNCTIONAL-MANAGEMENT RESPONSIBILITY, PRIMARILY FOR UNITED STATES OPERATIONS.

MANAGERS OF DOMESTIC OPERATING DIVISIONS.

LEGEND:

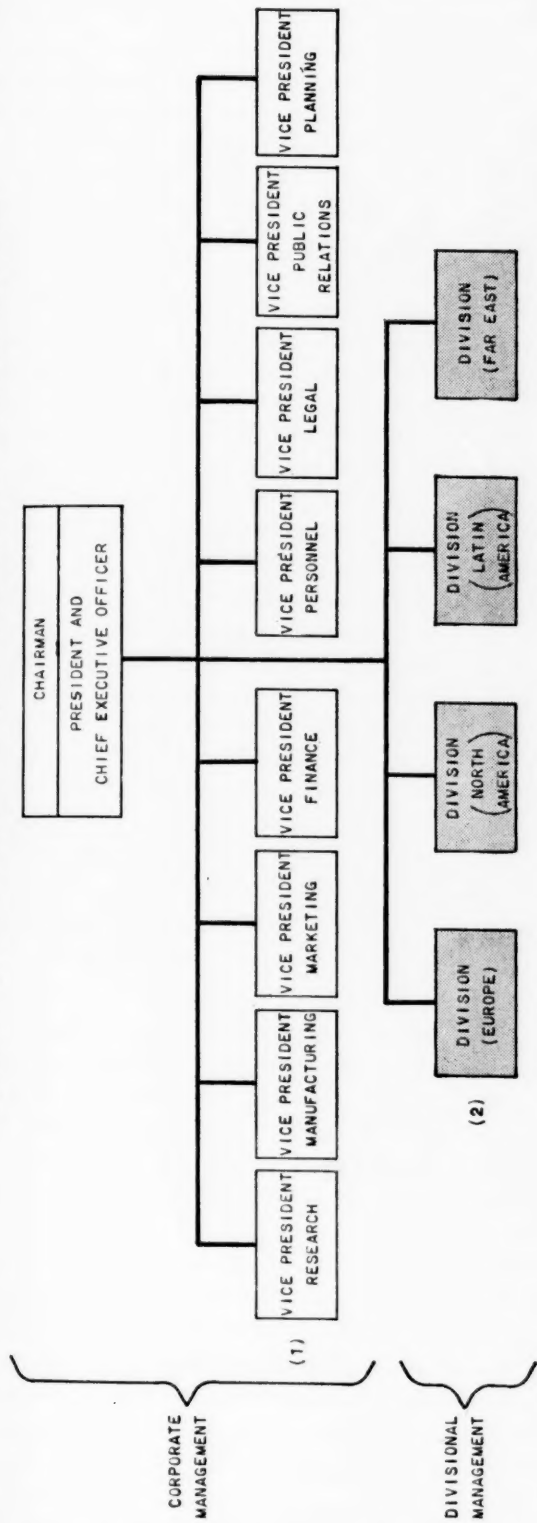
NOTES:

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FIGURE 2 BASIC STRUCTURE OF AN INTEGRATED ORGANIZATION

FIGURE 2
BASIC STRUCTURE OF AN INTEGRATED ORGANIZATION



EXECUTIVES WITH WORLD-WIDE RESPONSIBILITY; THAT IS, THEY ARE RESPONSIBLE FOR INTERNATIONAL ACTIVITIES AS WELL AS FOR DOMESTIC ACTIVITIES IN THE UNITED STATES AND ALL OTHER COUNTRIES.

EXECUTIVES WITH INTERNATIONAL (BUT NOT WORLD-WIDE) RESPONSIBILITY; THAT IS, THEY ARE RESPONSIBLE FOR ACTIVITIES INVOLVING MORE THAN ONE COUNTRY, BUT NOT THE ENTIRE WORLD.

THESE EXECUTIVES, ALL BASED AT HEADQUARTERS, EXERCISE STRATEGIC PLANNING, DECISION-MAKING COORDINATION, AND CONTROL FOR ALL FUNCTIONS AND ALL MAJOR PRODUCT LINES.

EXECUTIVE RESPONSIBILITY FOR A GEOGRAPHICAL AREA OF THE WORLD. THE RESPONSIBILITY IN EACH CASE CROSSES NATIONAL BOUNDARIES AND IS CENTERED ON A MANAGEABLE AREA OF GEOGRAPHY, OFFERING A PRACTICAL SPAN OF CONTROL FOR THE CHIEF EXECUTIVE THEREOF WHEN OVER-ALL STRATEGIC PLANS ARE APPROVED AT HEADQUARTERS, THIS "AREA MANAGER" BECOMES FULLY RESPONSIBLE, FOR EXECUTING THE PLANS, MANAGING OF COMPANY RESOURCES AND FACILITIES WITHIN THE GEOGRAPHICAL AREA, AND FOR ACHIEVING OPERATING TARGETS SPELLED OUT BY CORPORATE MANAGEMENT.

function on a world-wide basis and assume the responsibility for:

1. Developing world-wide policies and strategies for the corporation as a whole.

2. Coordinating the execution of policies on a world-wide basis.

3. Developing an effective system of communication and control, geared not to domestic needs alone, but to the international environment of the corporation.

4. Managing the corporate executive staff on a world-wide basis.

The first of these functions of corporate management is to map out world-wide strategies to ensure that: (1) business opportunities throughout the world are identified; (2) the corporation enjoys the best possible competitive position in the world markets; and (3) the return on corporate assets is maximized.

In determining the course to be followed by the corporation in its world-wide activity, corporate management must consider the following alternatives:

- Since no firm's resources are unlimited, capital projects should be appraised in a world-wide perspective. For example, if \$2 million are allocated to the construction of a new plant, in what part of the world would this new plant serve the business best and provide the highest return on investment?

- Marketing strategies should likewise be planned in a global perspective. For instance, considering the expenses related to the introduction of a new product, in what part of the world should this new product be launched in order to strengthen the company's competitive position and ensure the highest return on investment?

- Manufacturing centers should be utilized in order to place the company's products in the best possible competitive position. For example, where are the lowest cost production centers for each product, and how can they best be utilized?

- Research should be planned and con-

ducted in a manner that ensures the greatest return on dollars invested as well as the rational utilization of local talents and skills. For instance, would conducting research programs in various countries result in a cross-fertilization of ideas between groups in different fields and with different scientific disciplines? As the chief executive of a foreign corporation recently put it: "A better balance between fundamental and applied aspects of industrial research results from the European emphasis on the former and the American on the latter."

Thus, essentially corporate management in developing global strategies should be guided by the following principle: In what part of the world can every dollar we invest be of greatest value to our over-all operation and incur the highest return on investment?

The second prime function of Corporate Management in an integrated organization is that of coordination. It is axiomatic in military strategy that the collective strength of various units acting together far exceeds the sum of each unit acting individually. Likewise, the competitive strength of a corporation can be greatly increased through the coordination of its world-wide operation.

This coordinating function may be performed in various areas. For example:

- In the area of logistics and supply, management may coordinate the purchasing and production functions of the various operating units to ensure that each market is supplied with raw materials, component parts, and finished products at the lowest cost and under the most favorable competitive conditions.

- In the area of marketing, management may ensure that product planning, while recognizing local needs, aims at standardizing corporate products the world over so as to permit their circulation among markets.

- In the area of research, management may coordinate the work of the various research centers in order to avoid duplication of effort.

Thirdly, the development of world-wide

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strategies, their coordination, and their execution require an effective system of communication and control that provides information necessary for making sound, intelligent decisions at headquarters and overseas. In order to perform its function in the best corporate interest under changing circumstances, management must have complete and up-to-date information about its markets.

In a world of rapid and unforeseen changes, an international strategy may have a short life expectancy. Reappraisal and readjustments are as important to corporate success as the critical development of broad strategies. Thus, in a highly competitive economy, ignorance and misinterpretation of foreign business developments can have grave consequences.

Adequate Communication

In setting up an adequate system of communication, two main areas should be considered: the nature of the information desired and the channels of communication through which it will flow.

Ideally, the management of an international enterprise should have available on world markets the kind of information it deems indispensable for conducting its domestic operations. This encompasses background information of a permanent or semi-permanent nature about various markets—e.g., population and natural resources; current information on political, economic, and social developments and their implications for the company; and internal information of a technical nature, such as annual budgets and accounting and financial reports, all of which are aimed at headquarters control over operating units.

All of this information should, as much as possible, be presented on a comparable basis for each market and operating unit. Uniformity, consistency, and comparability of information are essential, because managing a world-wide business is to a large degree a matter of deciding between alternatives.

According to the company's particular

needs and the scope of its world-wide activity, management may adopt different solutions in setting up channels of communication. For instance, the information about business conditions abroad may be supplied by "market intelligence departments" at the operating units to a central management intelligence department at headquarters.

The latter, in turn, would edit them, compare them, and present them to middle and top management. An alternative would be to use an outside business service which would submit periodic reports on business conditions by market to top and middle management. Regardless of the channel chosen, the information must be timely. Moreover, it should be submitted to the responsible level of management promptly enough to permit corrective measures to be taken if they should be needed.

The last main function of corporate management in an international enterprise is to ensure that each corporate unit is staffed with the best personnel available. To accomplish this goal, corporate management must take an active interest in the company's recruiting, training, and promotion policies. Likewise, management must remain aware of the executive potential both inside the corporation and in the various markets where it operates. Finally, management should give every executive in the corporation an equal chance for further development and promotion regardless of national barriers. In a highly competitive world, no assets can be wasted.

The Role of Divisional Management

The reorganization of a company on an integrated basis will affect not only corporate management, but also divisional management. First of all, the creation of operating divisions responsible for the execution of corporate policies on an area basis will increase the number of persons in divisional management. Instead of having "domestic" and "international" sections, as in a segregated organization, an integrated company will consist of several divisions—e.g., North

America (United States and Canada), Common Market, Latin America; and each area will be managed by its own division head and functional staff; i.e., marketing, manufacturing, finance, etc.

Although the number of divisional executives will increase, the nature of their functions will not be technically different from those in a purely domestic company. The scope of those functions, however, will be different, and above all, so will the skills required in performing them.

It is axiomatic that without the proper managerial skills, no concept of organization can be successfully implemented. As a result, the success or failure of United States business in the next 10 to 15 years may well depend on its ability to generate international executives.

International Managerial Skills

All the business problems, regardless of their particular nature, posed to the management of an integrated company require the ability to think in terms of world markets and to understand their various conditions. This requirement must be met before any technical skill can be applied successfully. The internationalization of management thinking can stem only from an awareness of the world markets, an interest in international business, and the background necessary to "feel at home" in world-wide management.

It appears almost inevitable that, as stated earlier, by choice or by necessity, the next generation of management will be both aware of and interested in world trade. It does not follow, however, that the next generation will have accumulated the background required to move at ease in the international business world. This problem is perhaps of even greater importance if we consider that the fiercest foreign competition comes, in most part, from countries that have a long tradition of participation in world trade and a class of management that can truly be called "international."

Examine the five foremost requirements

of international management over and above technical skills:

1. The recognition and true appraisal of local skills and achievements, regardless of race, creed, and nationalities. There is an almost universal tendency among men to either overrate or underrate foreign skills and achievements. The management of an international enterprise cannot afford to do either. As far as possible, it must endeavor to appraise facts and people at their true value, with respect to the company. This is essential in order to take full advantage of the pool of skills and ideas available the world over.

2. The ability to communicate with people of different language, background, and philosophy of life. Over and above the knowledge of foreign languages, this ability assumes a thorough familiarity with a country's history, traditions, religion, etc., as well as the ability to adjust rapidly to different conditions of life.

3. A sensitivity to changing conditions in foreign markets. In developing broad strategies and carrying them through, management will inevitably be faced by unforeseen developments or changes in business conditions. How well the company will fare through a period of change will depend heavily on management's apprehension of the rate and direction of the changes.

4. The ability to understand and foresee world-wide trends. In plotting the course of a company, top management will have to rely heavily on a sound appraisal of general political, economic, and social conditions in the world and their foreseeable evolution.

5. The ability to appreciate the relativity of business ethics in various countries and to adjust to different ways of doing business. In other words, the management of an international enterprise should not find itself at a competitive disadvantage in business negotiations because of its inability to think in "foreign terms."

These abilities are of cardinal importance

to the successful management of a world-wide business. Understandably, their importance varies according to the level of management. It can be safely assumed, however, that the degree to which they are possessed by executives may well spell the difference between top and middle management in an international enterprise.

We inquired earlier whether the next generation of management will be equipped with these international skills. The answer to this question depends on which level of management is considered. The next generation of top management is in most part at the middle-management level now. The next

generation of middle management is at the junior executive stage or even still in college and business school. It is therefore the dual responsibility of management and universities to develop international executives.

This dual responsibility raises two basic challenges:

- It is evident that the executives of the international enterprises of the 1970's will come in most part from the domestic operation of today. Will they be prepared to assume international responsibilities?

- Likewise, will the business school student of today be trained to think and work in the perspective of a world-wide market?

If any one quality distinguishes the successful executive, it is his ability to see his organization as a whole, in the framework of the total economic, social, and political climate in which he operates. It is his lot to weld the many separate functions of the various departments of his company into a single forward-moving force. It is his responsibility to direct that force into the most productive channels, recognizing all the considerations outside the company which will determine what these channels are at any given time.

D. J. Russell

Industry's Role in Metropolitan Growth: A Public Management Problem

JAMES GILLIES

This article explains how industrial growth is related to expanding metropolitan areas, and sets forth specific recommendations for assuring balanced growth of both.

It is widely predicted that the United States will undergo an astonishing population growth during the next two decades.¹ If the trends of the past decade continue, and there is no evidence to indicate that they will not, a large part of the population growth will be centered in the major metropolitan areas of the nation. This raises the question as to whether or not the economic base of these regions can increase sufficiently to support the population growth and still remain stable, particularly if the basic industries of the rapidly expanding areas are highly dependent upon the whims of outside influences. California, with its flourishing metropolitan areas and concentration of defense industries, provides an excellent opportunity for study and analysis of a situation which is certain to become nationwide in the next decade.

This article examines two specific questions which are fundamental to an understanding of the problem. First, what is the relationship between expansion of manufacturing and population growth in metropolitan areas? Second, how can the available resources of an area be most effectively managed as population expands? Both these questions raise major policy issues for Californians. On the basis of the results of the analysis some proposals are made for assuring stable and prosperous conditions in rapidly growing metropolitan areas.

¹ For an example see Howard Neilson, *Population Trends in the United States Through 1975*, Menlo Park: Stanford Research Institute, 1955.

Economic Base Adjustments in an Expanding Economy

In few fields of economic analysis is it more difficult to analyze properly cause and effect than in the area of metropolitan growth and development. Does population come to an area because there are employment opportunities or are employment opportunities created because there is a large population in a region? The answer is, of course, that there is an interrelationship. As an area grows, markets are created which must be served and therefore new "market oriented" firms locate in a region to serve the needs of the population. While a newly developing area can expand as a result of an inflow of investment from other regions, it is rather generally accepted that, in the long run, no area can grow and develop without some "base industries."² Base industries are defined as those that produce goods and services for sale outside of the immediate area within which they are located. This sale generates a flow of income and capital into an area which causes an expansion of plant and equipment, which in turn creates new employment opportunities and induces population to come to the region.

In southern California, it is obvious that the aircraft industry has been a major source of basic employment. The products of this

² For a discussion of economic base analysis see A. M. Weimer and Homer Hoyt, *Principles of Urban Real Estate* (New York: The Ronald Press, 1954). For analysis of some limitations in this type of approach see James Gillies and William Grigsby, "Limitations in the Use of Base Ratio Analysis," *Journal of the American Institute of Planners*, Winter, 1956.

great industry are sold throughout the nation—indeed, the world. As a result of the employment created by the industry, hundreds of thousands of related service activities have been needed—stores, doctors, professional people. If the aircraft industry were to reduce its output substantially, the results in the economy would extend far beyond unemployment in that one industry—the related services would also suffer.³

Therefore, it seems reasonably apparent that for growth there must be a significant amount of base industry. An area can survive, but it cannot grow, if everyone is employed providing services for everyone else in the same region.

The Change in California's Economic Base

Since California has undergone a substantial growth since 1940, it is possible to test empirically whether or not this growth has been the result of a change in the economic base of the State. More significantly, it is possible to determine if the economic base of the major metropolitan areas in the State have changed and, indeed, if there is any correlation between the change in the economic base and the rate of growth of various areas.

California, as of 1959, has a population of approximately 15 million, 83.4 per cent of which lives in the nine designated metropolitan areas of Los Angeles—Long Beach (Los Angeles and Orange Counties); San Francisco—Oakland (Alameda, Contra Costa, Marin, San Francisco, San Mateo and Solano Counties); San Bernardino—Riverside (San Bernardino and Riverside Counties); San Jose (Santa Clara County); Stockton (San Joaquin County); Sacramento (Sacramento County); Fresno (Fresno County); San Diego (San Diego County) and Santa Barbara (Santa Barbara County).⁴

³ While there are no exact figures on the relationship between "basic" and "service" employment, a ratio of two jobs in "service" activities for every one in "base" industries seems appropriate for large metropolitan areas.

⁴ Metropolitan areas are designated by the Census when a county or group of contiguous counties contain a city of 50,000 people or more. In order for a county to be designated as metropolitan, it must have the follow-

ing characteristics—(a) at least 10,000 non-agricultural workers or (b) contain ten per cent of the non-agricultural workers in the standard metropolitan area or (c) have at least one-half of the population residing in minor civil divisions with a population density of at least 150 per square mile contiguous to the central city. In addition, non-agricultural workers must constitute at least two-thirds of the total number of employed persons in the county.

Have these areas undergone much basic change in their economic structure during the past few decades? The metropolitan areas⁵ of the State of California vary markedly with respect to size and the nature of their economic activity.

To date, Los Angeles and San Francisco have dominated the State in terms of economic activity and 63 per cent of all personal income earned throughout the State is earned in these two metropolitan areas. The causes leading to the dominance of these regions are reasonably well known and are rooted as much in history as they are in economics.

However, it is interesting to note that the economic bases of the two areas are quite different and that changes in the economic base of the two regions since 1940 have not been at all parallel. Indeed, all of the metropolitan areas of California display unique base characteristics.

In terms of both relative importance and absolute numbers of people employed, the Los Angeles metropolitan area is the most industrialized in the State and it has become much more so in the past decade.⁶ In 1947, 32 per cent of all non-agricultural private employment in the metropolitan area was in manufacturing; by 1956, manufacturing employment amounted to almost 41 per cent. In absolute terms, this means almost a doubling of total manufacturing employment in ten years. It also means, relatively speaking, that every other type of employment source in the area—mineral extraction, contract construction, transportation and communications, wholesale and retail, finance, insur-

⁵ Because of its recent designation as a metropolitan area and because of lack of data for the area, Santa Barbara County is not included in the analysis.

⁶ The most recent comparable data available for analyzing changes in employment in major metropolitan areas are for the year 1956. There is little indication that the trends indicated by these data have been reversed in the past three years.

ance and real estate, and service industries—declined in relative, although not absolute, importance as a source of employment.⁷

In San Francisco, on the other hand, the situation was quite different. In fact, between 1947 and 1956 manufacturing, as a source of employment, declined in relative importance in the San Francisco metropolitan area, and in terms of absolute change it increased only moderately. Contract construction, finance, insurance, real estate, and the service industries all increased their proportionate share of the labor market reflecting the comparative strength of San Francisco as a financial and trade center. For example, 8.3 per cent of all employment in San Francisco was in the finance classification in 1956, compared to 6.3 per cent in Sacramento—the area in which finance was next most important as a source of employment. The significant point to note, however, is that manufacturing showed a relative decline in importance.

The San Diego metropolitan area, on the other hand, recorded a large increase in manufacturing in the decade between 1947 and 1956—again both relatively and absolutely—and all other sources of employment with the exception of finance, insurance and real estate declined in relative importance.

The San Jose metropolitan area, without doubt, has undergone the greatest structural change in the postwar period. It has recorded the greatest relative increase in manufacturing as a source of employment, an increase from approximately 11 per cent in 1947, to almost 39 per cent in 1956. Contract construction also increased markedly in San Jose, but the importance of wholesaling and retailing has dropped appreciably. The San Bernardino-Riverside area has undergone relatively little change in the proportion of employment in various types of activities although total employment in the area has increased by 40 per cent. Stockton and Fresno have also remained relatively unchanged, although manufacturing has increased rela-

tively in the latter to the detriment of wholesaling and retailing.

In Sacramento, manufacturing is relatively less important than in any other metropolitan area which, of course, is to be expected, since approximately 40 per cent of total employment in Sacramento is in the government; but in Sacramento, as in certain other areas of the State, manufacturing is increasing in importance.

From this brief analysis, it is apparent that in Los Angeles, San Diego, and San Jose manufacturing employment provides the largest proportion of all employment. In 1947, this was only true of Los Angeles. At that time, manufacturing supplied only 2.7 per cent more jobs than the wholesale trade, whereas in 1956 it supplied 15 per cent more. It is also evident that in these three areas the percentage increase in employment was greater in manufacturing than in any other type of activity.⁸ These were also the areas where population growth was the greatest.

San Francisco, Stockton, Sacramento, San Bernardino, Riverside and Fresno did not grow as rapidly in the period of time as did Los Angeles, San Diego and San Jose. While the correlation is not perfect, the evidence seems reasonably clear; a condition for population expansion of major proportions is the expansion of major base industries and, given the structure of California's economy at the mid-point of the twentieth century, this means an expansion of manufacturing.

If the demographers are correct in their predictions of California's population growth, the corollary of the proposition is that there will be (1) tremendous expansion in manufacturing operations within the State, or (2) large-scale unemployment within the State, or (3) the growth will simply not take place.

It is, in fact, possible to roughly quantify the extent of the changes which will have to take place in manufacturing if the population is to reach 31,650,000 by 1980—an in-

⁷ The data on which this and the following analyses are based are contained in Tables I, II, and III.

⁸ This was also true of Sacramento, but manufacturing was not the major source of employment in the area.

crease of 16 million in twenty years. Between 1947 and 1956, the population of the State increased from 9,672,000 to 13,260,000 or by 3,592,000. During the same period the total private non-agricultural employment increased by 1,174,000 and manufacturing employment increased by 494,000, or by about 59,000 positions per year. Assuming no change in the economic base of the State, and this is a conservative assumption, it will be necessary to provide approximately 2,000,000 positions in manufacturing between 1960 and 1980 if the population growth forecast for the state is to be maintained. In essence, this means roughly doubling the amount of manufacturing employment in the State in the next two decades.

The implications of this analysis are indeed important. Will this large amount of manufacturing expansion take place in the State? Presumably, since a comparable rate prevailed in the past, there is reason to believe that a similar rate can prevail in the years to come.

Perhaps more significant questions are: What will be the structure of the economic base of the metropolitan areas in the State in 1980, assuming that the growth is achieved? Does this great increase in manufacturing imply the development of metropolitan areas without any economic diversification; or the development of areas subject to rapid fluctuations in economic activity with all the related difficulties which such fluctuations create?

These questions are particularly pertinent to California since it is often suggested that the urban economies in California are not well diversified.

Normally diversification implies a variety of types of employment sources—agricultural, manufacturing, mining, etc.—but in urban areas where there is a concentration of employment in non-agricultural activities, it is appropriate to consider an area diversified if there is a wide variation among the types of basic manufacturing operations.

In analyzing the degree of diversification within the State, it is apparent that the met-

ropolitan areas vary tremendously in the degree of diversification in their economic base.⁹ San Francisco is the most diversified of the metropolitan areas in the State, but it is also the one which has changed the least in the past decade and has had less growth than the average. At the other end of the spectrum, San Diego is the least diversified of California's metropolitan areas. Almost 80 per cent of the total manufacturing employment in the area is in the aircraft and missiles industries and firms related to aircraft manufacturing.

Diversification in the Los Angeles area is reasonably close to the pattern in San Francisco, and both San Bernardino and San Jose have a relatively high degree of diversification. The reason for this is that while the manufacturing area of employment within the State does include a number of firms which are very subject to cyclical patterns, it should not be forgotten that the food-processing industry, which has a considerable degree of stability, is still one of the three largest industrial groups in the State and in five of the California metropolitan areas—Fresno, Stockton, Sacramento, San Jose and San Francisco—the manufacturing of food and kindred products remains the largest single industry within the manufacturing group.

Actually, until 1951 the manufacturing of food and related products was the largest single industry group in the State, but as the State has grown this particular segment of manufacturing activity has lost some of its dominant position.

The Costs of Growth

In general, there is much more diversification in the economic base of the State than is generally recognized, but one of the costs of growth has been the increasing importance of manufacturing as a source of employment and, indeed, in certain areas where manufacturing employment has been concentrated in one industry (such as in San

⁹ The measure of diversification of the economic base of the metropolitan area of California was developed by analysis of 21 major industrial groups. The results are shown in Table IV.

TABLE I
NON-AGRICULTURAL PRIVATE EMPLOYMENT, CALIFORNIA METROPOLITAN AREAS 1947-1956
(in thousands)

	Mineral Extraction		Contract Construction		Manufacturing		Trans. & Communic.		Wholesale & Retail		Fin., Ins. & R.E.		Service Industries		Total	
	1947	1956	1947	1956	1947	1956	1947	1956	1947	1956	1947	1956	1947	1956	1947	1956
Los Angeles.....	14.4	15.1	94.1	142.7	387.1	748.8	84.6	113.6	355.7	408.4	63.3	96.0	180.6	251.6	1,180.0	1,836.0
San Francisco.....	1.7	1.7	51.8	66.9	178.1	191.7	78.1	86.8	196.2	213.8	46.9	58.9	80.3	92.4	632.9	712.0
San Diego.....	.1	.2	8.9	14.4	21.6	37.6	7.6	10.9	31.2	44.6	4.2	8.0	14.9	21.3	88.6	156.9
San Jose.....	.5	.1	1.8	12.4	2.1	38.0	1.4	6.7	8.2	26.0	.8	4.1	3.7	10.9	18.5	98.1
San Bernardino-Riverside.....	.6	1.1	6.2	13.6	15.5	29.3	5.3	7.4	24.3	35.4	2.3	4.7	9.2	17.6	63.5	109.1
Sacramento.....	.6	.5	5.3	9.6	8.3	15.3	5.5	7.0	19.7	26.0	3.0	4.6	6.9	9.4	49.1	73.0
Stockton.....	.1	.2	3.3	3.8	10.0	11.8	3.4	5.0	12.4	14.4	1.1	1.6	4.3	4.5	34.6	41.3
Fresno.....	1.1	1.0	3.8	5.0	8.7	14.5	4.7	6.4	18.9	22.5	1.5	2.9	5.9	7.7	44.6	60.0
*California.....	37.0	41.0	252.0	372.0	754.0	1,246.0	320.0	371.0	954.0	1,194.0	157.0	232.0	649.0	841.0	3,123.0	4,297.0
*U. S.....	943.0	816.0	1,982.0	2,993.0	15,290.0	16,905.0	4,122.0	4,157.0	9,196.0	11,292.0	1,672.0	2,306.0	4,783.0	6,231.0	37,988.0	44,700.0

Source: California State Department of Employment and U.S. Department of Labor, Bureau of Labor Statistics.
* U.S. and California figures have been rounded off to the nearest 1,000.

TABLE II
NON-AGRICULTURAL PRIVATE EMPLOYMENT, CALIFORNIA METROPOLITAN AREAS, PROPORTION IN VARIOUS INDUSTRY GROUPS 1947-1956
(in per cent)

	Mineral Extraction		Contract Construction		Manufacturing		Trans. & Communic.		Wholesale & Retail		Fin., Ins. & R.E.		Service Industries		Total	
	1947	1956	1947	1956	1947	1956	1947	1956	1947	1956	1947	1956	1947	1956	1947	1956
Los Angeles.....	1.2	.8	8.0	7.8	32.8	40.8	7.2	6.2	30.1	25.5	5.4	5.2	15.3	13.7	100.0	100.0
San Francisco.....	.3	.2	8.2	9.4	28.1	26.9	12.3	12.2	31.0	30.0	7.4	8.3	12.7	13.0	100.0	100.0
San Diego.....	.1	.1	10.0	9.2	24.4	36.7	8.6	6.9	35.2	28.4	4.7	5.1	16.8	13.6	100.0	100.0
San Jose.....	2.7	.1	9.7	12.6	11.4	38.7	7.6	6.8	44.3	20.5	4.3	4.2	20.0	11.1	100.0	100.0
San Bernardino-Riverside.....	.9	1.0	9.8	12.5	24.4	26.9	8.3	6.8	38.3	32.4	3.6	4.3	14.5	16.1	100.0	100.0
Sacramento.....	1.2	.7	10.8	13.2	16.9	21.0	11.2	9.6	40.1	35.4	6.1	6.3	14.1	12.9	100.0	100.0
Stockton.....	.3	.5	9.5	9.2	28.9	28.6	9.8	12.1	35.8	31.9	3.2	3.9	12.4	10.9	100.0	100.0
Fresno.....	2.5	1.7	8.5	8.3	19.5	24.2	10.5	10.7	42.4	37.5	3.4	4.8	13.2	12.8	100.0	100.0
California.....	1.2	1.0	8.1	8.7	24.1	29.0	10.2	8.6	30.5	27.8	5.0	5.4	20.8	19.6	100.0	100.0
U. S.....	2.5	1.8	5.2	6.7	40.2	37.8	10.9	9.3	24.2	25.3	4.4	5.2	12.6	13.9	100.0	100.0

Source: Table I.

Los Angeles
San Francisco
San Diego
San Jose
San Bernardino
Riverside
Sacramento
Stockton
Fresno
California
U. S.

Source:

Diego) the degree of diversification has dropped substantially. Clearly, where this has happened the area is subject to grave problems if anything occurs to decrease the demand for the products of these major industries.

The analysis suggests that a natural concomitant of growth, indeed a necessary condition for growth, in California during the next ten years is expansion of the amount of manufacturing in the State. This expansion will cause more diversification of the economic base of some of the metropolitan areas—particularly Sacramento, which in the past has relied heavily on government as a major source of employment, and Fresno and Stockton, which heretofore have relied on food processing as a major industry. However, if, in other areas in the State as a whole, manufacturing employment increases (as it must) in the same industries as it has in the past ten years, then the diversification within the State will decrease. The implication of this change in the economic base of some of the metropolitan areas, in terms of economic stability, are obvious.

The solution, of course, is to create within the State a climate of opinion and policy which will encourage growth of those industries which the State does not now have, in order to achieve as much variety of manufacturing activity as possible.

Resource Allocation in an Expanding Economy

Equally important as the problem of the shifting nature of the economic base of the metropolitan areas of the State of California, in light of the prospective population increase in the next twenty years, are the problems associated with resource allocation in view of such expansion.

The traditional way in which resources are chosen for various uses in our free-enterprise economic system is through the price system—resources flow to those areas where they yield the highest return.¹⁰

There are few who would argue that the price system can be surpassed as a method of effectively allocating resources, but it must be remembered that prices are set within an institutional (normally government created) framework and this framework can have considerable influence on the results achieved by the price system.

The problems associated with the use of resources in the face of great growth are complex and many, but two predominate—the changing pattern of land-use and financing the development necessary if land is to be put into its highest and best use.

If the population of the State grows by 16 million people in the next twenty years,

¹⁰ For a discussion of this problem see George J. Stigler, *The Theory of Price*, (New York: 1946).

TABLE III
NON-AGRICULTURAL PRIVATE EMPLOYMENT, CALIFORNIA METROPOLITAN AREAS
PERCENTAGE GROWTH 1947-1956

	Mineral Extraction	Contract Const.	Manufac- turing	Trans. & Communic.	Wholesale & Retail	Fin., Ins. & R.E.	Service Industries	Total
Los Angeles.....	+ 4.9%	+ 51.6%	+ 93.4%	+ 34.3%	+ 31.7%	+ 51.7%	+ 39.3%	+ 55.6%
San Francisco.....	...	+ 29.2	+ 7.6	+ 11.1	+ 9.0	+ 25.6	+ 15.1	+ 12.5
San Diego.....	+100.0	+ 61.8	+ 166.7	+ 43.4	+ 42.9	+ 90.5	+ 43.0	+ 77.1
San Jose.....	- 80.0	+588.9	+1709.5	+378.6	+217.1	+412.5	+194.6	+430.3
San Bernardino- Riverside.....	+ 83.3	+119.4	+ 89.0	+ 39.6	+ 45.7	+104.3	+ 91.3	+ 71.8
Sacramento.....	- 16.7	+ 81.1	+ 84.3	+ 27.3	+ 35.0	+ 53.3	+ 36.2	+ 48.7
Stockton.....	+100.0	+ 15.2	+ 18.0	+ 47.1	+ 16.1	+ 45.5	+ 4.7	+ 19.4
Fresno.....	- 9.1	+ 31.6	+ 66.7	+ 36.2	+ 19.0	+ 93.3	+ 30.5	+ 34.5
California.....	+ 10.8	+ 47.6	+ 65.3	+ 15.9	+ 25.2	+ 47.8	+ 29.6	+ 37.6
U. S.....	- 13.5	+ 51.0	+ 10.6	+ .8	+ 22.8	+ 37.9	+ 30.3	+ 17.7

Source: Table I.

so that by 1980 there will be almost 27 million people in the major metropolitan areas, approximately 2,000,000 acres of land will be transferred into urban use. Basically, this land can be made available from (1) subdivision of vacant land already within metropolitan areas, (2) raw vacant land surrounding metropolitan areas and (3) existing agricultural land.

While the first two sources will be important, there is little doubt that the metropolitan growth of the next twenty years is going to create great pressure on agricultural lands. There has already been substantial transfer of land from agricultural to urban use to accommodate the growth of the past two decades, and this transfer will continue at an increasing rate. This trend, of course, means that agriculture must seek other areas of operation.

Land presently in pasture and forests will need to be placed into active cultivation. It is inevitable that this transfer will take place, assuming that no artificial restrictions are placed upon the transfer of such land from rural to urban use. Clearly, the land will be more valuable in urban uses and therefore there will be a tendency for farm owners to sell. This land transfer is a clear-cut case of the price system allocating resources to their

highest and best use, when highest and best use is measured in an economic sense.¹¹

Such a transfer of land, of course, could be prevented by strategic rural zoning and other similar regulations; indeed, there will be pressure for such measures. However, given the extent of future population growth, it is inevitable that such land will, in general, be transferred into more intensive use.

While zoning laws might slow down the processes, it is doubtful that they could withstand the immutable laws of the market place. Given this fact, it therefore seems important that in assessing the impact of the great population increases in the State in the next twenty years, care should be taken to recognize the resource allocation pattern that the market will create and to use the market in developing and planning the land-use of the metropolitan regions.

One of the great advantages of recognizing the degree of expansion developing in the major metropolitan areas is that it provides opportunities for careful planning of public facility needs in a region. If methods can be developed for selecting and acquiring land for schools, public buildings and recre-

¹¹ For an analysis of this problem see Howard Gregor, "Urban Pressures on California Land," *Land Economics*, Nov. 1957; and James Gillies and Frank Mittelbach, "Urban Pressures on California Land: A Comment," *Land Economics*, Feb. 1958.

TABLE IV
1956 DIVERSIFICATION INDEX*

Area	Crude Diversification Index	Refined Diversification Index
United States	1479.8	
California	1624.0	.233 (compared to U.S.)
San Francisco	1620.9	-.007 (compared to Calif.)
Los Angeles	1661.2	.078
San Bernardino	1735.6	.234
San Jose	1803.4	.378
Fresno	1885.2	.549
Stockton	1912.3	.606
Sacramento	1928.1	.639
San Diego	1942.8	.670

* For a discussion of this index see Allan Rodgers, "Some Aspects of Industrial Diversification in the United States" *Regional Science Association Papers and Proceedings* (Volume I, 1955).

The index is constructed on the basis of the twenty-one major industrial groupings in the United States. In the crude diversification index a reading of 2100 would imply absolutely no diversification. Therefore, the closer to 2100 the less the degree of diversification. San Diego is the least diversified area in California, and San Francisco is actually more diversified than the state as a whole.

The refined index is a measure of diversification of the metropolitan areas in the State when compared to California as a whole rather than the United States. Again San Diego is the least diversified and San Francisco is shown as being more diversified than the State. In the refined index the degree of diversification among areas within the State is more clearly indicated than in the crude index.

ational facilities well in advance of development, then unquestionably a great deal of money can be saved by communities through acquiring sites before development increases costs.

In addition, areas can be planned to provide the maximum advantages in terms of present planning knowledge. One restriction on planning in so many regions is that it cannot undo the mistakes of commission in the past; in the next twenty years in California the basic mistakes in planning will probably be mistakes of omission, because areas are not planned far enough in advance of development.¹²

Finance and Investment in an Expanding Economy

A growth of an area equivalent to that anticipated for California in the next twenty years raises important questions of finance—both public and private.

Clearly, if there is to be a doubling of the metropolitan areas in the next twenty years, the metropolitan regions must be in a position to supply the necessary municipal services to meet the needs of the increased population.

It has been estimated that in California approximately \$13,000 of public capital facilities must be provided for every new family coming into the State.¹³ As a first approximation, therefore, about \$60 billion of capital expenditure must be made in the next twenty years on public facilities¹⁴—and this excludes direct expenditure on the part of the State and Federal governments.

Where will the money come from to fi-

nance these capital improvements? Traditionally, municipalities have been limited in their sources of funds to the real property tax, the sales tax, certain licensing provisions, and, of course, the sale of bonds.

Currently, in spite of great prosperity, municipalities are finding it difficult to meet their financial obligations. Given the magnitude of municipal needs in the next two decades in California, it is clear that the financial basis of municipalities must be examined to determine their capacity for supplying the essential requirements to meet the needs of the forecasted population.

Equally interesting is the question of whether or not private organizations will be able to raise sufficient funds to finance the capital expansion necessary to provide employment for the 5 to 5.5 million people who will seek employment if there is a population increase of approximately 16 million in the next two decades. A conservative estimate places this sum at between \$80 and \$100 billion as well as some \$55 to \$70 billion to replace worn-out plant and equipment.¹⁵ In addition, of course, there is the \$55 billion needed by municipalities plus an additional \$100 billion to finance residential construction.¹⁶ This expansion means that in the next twenty years approximately \$300 billion must be invested in California.

As any newly developing region, California has always been a capital scarce area. If, as is predicted, there is a general investment upsurge throughout the nation in the 1960's, the problem of financing California's growth is certain to be very acute. Methods of encouraging investment in California must be designed if the State is to achieve its forecasted development in the next two decades.

Conclusions

The economic implications of the forecasted growth of the metropolitan areas of California extend, of course, far beyond the few discussed in this paper. Economists, like

¹² For a discussion of planning problems in California see James Gillies and Ernest Engelbert, "Planning of Physical Facilities," *Working Papers on Metropolitan Affairs in California*, California Conference on Metropolitan Affairs, 1957 (Released in Spring, 1959). Also, "Comments on James Gillies' Paper, 'Planning of Physical Facilities'" by Faculty Members, Department of City and Regional Planning, University of California, Berkeley, Idem.

¹³ This figure is developed from a report of the Southern California Research Council, *The Cost of Metropolitan Growth* (Los Angeles, 1958).

¹⁴ Idem. The distribution of expenditures has been estimated as follows on the basis of reports of the Southern California Research Council: Water—\$600 million; Flood Control—\$3,300 million; Sewerage—\$1,000 million; Streets—\$40.8 million; Schools—\$7.6 million; Hospitals—\$.5 million; Parks—\$1.2 million.

¹⁵ Southern California Research Council, *The Next Fifteen Years* (Los Angeles: 1955). This report is the basis for development of the figures.

¹⁶ Estimated on the basis of average family investment in residential real estate during the past decade.

most social scientists, consider almost any problem associated with the relationship of people to their environment as falling within their purview. However, the most significant, but by no means the only, implications of the forecasted development appear to be essentially as follows:

- In order for the projected population expansion to be reached, there must be an increase of approximately 5 to 5.5 million new jobs in the State between 1960 and 1980. If existing trends continue, this employment will be provided in manufacturing.
- The past expansion of manufacturing in the State has brought increased diversification of the economic base to some of the metropolitan areas within the State and less diversification to others. A continuation of the trend of the past ten years will, however, lead to a concentration of employment within one or two major industrial groups. This means that certain of the metropolitan areas within the State will be much more subject to cyclical variations in economic activity in the future than they have been in the past.
- The increased volume of manufacturing expansion will require a capital investment in the next twenty years in the neighborhood of \$100 billion. In addition, investment to replace worn-out plant and equipment will amount to \$55 to \$70 billion and public expenditures will approach \$55 billion.
- The costs of increased urbanization will

call for a restructuring of the financial base of most municipalities.

- The great urbanization movement indicates the development of substantial changes in the use of urban land—particularly major transfers from rural to urban uses.

In terms of an action program the analysis suggests:

- Developing means and methods for encouraging manufacturing expansion in the State.
- Actively encouraging the growth of more diversified manufacturing by providing incentives for different types of firms to come to California.
- Providing a favorable climate to increase the flow of capital to California.
- Encouraging planning commissions to carefully consider the importance of the market place as a mechanism for directing the use of resources.
- Developing a mechanism whereby cities can acquire land for public use well in advance of development.
- Exploring means and methods of expanding the financial resources of municipalities.

These suggested actions are all in areas where appropriate study can lead to possible legislation which can and should appreciably influence the future development of the State of California, or any other state facing the same problems with respect to metropolitan growth.

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How to Evaluate Investment Proposals

SEYMOUR FRIEDLAND

A practical demonstration of how capital budgeting can be used to make better decisions on new investments and re-equipment policy.

Capital budgeting can be used to evaluate new and existing investments as well as to determine the sources of funds that should be used to finance these investments. In one process, the system can simultaneously answer these important questions:

- Which of the new investment proposals should be undertaken?
- Which of the existing investments should be replaced?
- Which of the available sources of funds should be used to finance investments?
- Which of the presently utilized sources of funds should be refinanced?

In addition, the capital budgeting process generates a cut-off rate which can be used between budgeting points to evaluate new investment proposals and new sources of funds.

Investment decisions often represent the most crucial area of decision-making within the firm. Thus it is not surprising that there has been much written about the evaluation of investment projects over the last decade.¹ Most of these studies deal with the evaluation of new investment proposals. Although this is quite important, the evaluation of ex-

isting investments, i.e., the development of re-equipment policy, is of even greater importance since the bulk of investments are "tied-up" in existing investment projects. In those instances where re-equipment is discussed, it is usually restricted to the narrow consideration of replacement of an existing investment with a similar, but newer, investment.² Industrial experience indicates the need for a re-equipment policy broad enough to test the probability that an existing investment should be replaced with a totally different type of new investment; for example, replacing the investment in a cotton finishing operation with an investment in an electronics assembly. As Dean³ has pointed out, these problems can be handled only in the broad context of a capital budgeting system.

The purpose of this article is to demonstrate how an integrated capital budgeting system can be used and to discuss some of the practical difficulties involved in integrated capital budgeting. In addition, examples of the arithmetic involved in the evaluation of new investments and in the solution of re-equipment problems are shown in the appendix.

Outline of the Capital Budgeting Procedure

The aim of the capital budget is to ascertain that the rate of return on each investment project undertaken is not less than the cost of funds needed to finance the project.⁴ Con-

¹ A partial list of the writings must include the following: *Harvard Business Review*: R. H. Baldwin, "How to Assess Investment Proposals," May 1959; J. G. McLean, "How to Evaluate New Capital Investments," November 1957; R. Reul, "Profitability Index for Investments," July 1957. *Journal of Business*: M. J. Gordon, "The Pay-off Period and the Rate of Return," October 1955; E. Renshaw, "A Note on the Arithmetic of Capital Budgeting and the Problems of Reinvesting Cash Proceeds," October 1957; G. Shillinglaw, "Profit Analysis for Abandonment Decisions," January 1957; E. Solomon, "The Arithmetic of Capital Budgeting Decisions," April 1956. J. Dean, *Capital Budgeting* (New York: Columbia University Press, 1956). R. N. Anthony, *Management Accounting* (Homewood: Richard D. Irwin, 1956), ch. 18.

² For an illustration, see Anthony (in note 1).

³ Dean, *Capital Budgeting* (in note 1).

⁴ See Dean for a more general statement of capital budgeting principles.

versely, the cost of any source of funds should not be more than the rate of return on the investment financed by that source of funds.

The general procedure for capital budgeting is as follows:

1. On the basis of forecasts, calculate the rate of return for all proposed investment projects and for all existing investment projects. (See appendix for examples of the arithmetic involved.)
2. Place these projects—new and old—in order of diminishing rate of return.
3. Again on the basis of forecasts, estimate the cost of capital for each available source of funds. The sources of funds include external sources (stock issues, loans, etc.), internally generated sources (including retained earnings and amortization allowances), and the liquidation

of existing investments. Included also would be existing sources of funds. These sources would be refinanced if the cost of capital for the existing sources exceeds the rate of return generated by the projects in which these funds are invested. For each of these sources of funds, a cost can be calculated.⁵

4. Place these sources in order of increasing cost.
5. Compare the schedule of investment projects with the schedule of sources of funds to determine the cut-off rate, the investment projects which will be undertaken, and the sources of funds which will be used to finance the investment projects.

A simplified example follows:

INVESTMENT PROJECTS

INVESTMENTS	RATE OF RETURN OF EACH PROJECT	CUMULATIVE TOTAL CASH OUTLAY
A	30%	\$1,000,000
B	25%	1,750,000
C	20%	3,000,000
D	15%	3,500,000
E	10%	4,750,000
F	5%	5,000,000

SOURCES OF INVESTMENT FUNDS

	COST OF EACH SOURCE	CUMULATIVE TOTAL OF AVAILABLE FUNDS
Long-term bank loans	8%	\$1,000,000
Internal Sources	12%	2,000,000
Bonds	20%	3,000,000
Funds from Liquidation	30%	4,000,000
Stock Issue	35%	5,000,000

In the example, investment projects A, B, and C would be undertaken. They would be financed by long-term bank loans, internal sources, and bonds. The cut-off rate would be 20 per cent. If an existing investment had a rate of return of less than 20 per cent, it would be liquidated even if the rate of return of a similar new investment were below the rate of return on the existing investment, i.e., the old investment would be liquidated even if, according to traditional replacement tests, there were no need for replacement.

By using this criterion as a test of re-equipment, the firm broadens its horizons.

Instead of merely considering whether or not it is profitable to replace an existing investment with a new but similar investment, the firm tests the profit validity of an area of its activities. As a result, a textile firm may find it wise to retrench its textile manufacturing activities and to diversify into electronics or chemicals. A fully integrated manufacturer may discover it more profitable to spin-off some operations and invest the recovered

⁵ The problems in estimating the costs of the various sources of capital are best treated in the article by David Durand, "Costs of Debt and Equity Funds for Business: Trends and Problems of Measurement" in *Conference on Research in Business Finance* (New York: National Bureau of Economic Research, 1952), p. 215.

funds in a brand identification advertising program.

Since the capital budgeting process is not costless, it may not be feasible to use it for every equipment or financing decision that arises in the course of events. For example, a full capital budget may be developed only once a year. Yet equipment and financing decisions may have to be made during the year. The cut-off rate may be used as a guide for decisions during an inter-budgeting period. Investments may be rejected unless they are expected to earn at least the cut-off rate established by the latest capital budget. Funds which cost more than the cut-off rate may be disregarded.

Evaluating Profitability of Capital Investments

The true rate of return for an investment will discount the expected net cash inflow generated by the investment to equal the cash outlay of making the investment. More formally, the discounting process can be described as

$$C = \frac{S_1}{1+r} + \frac{S_2}{(1+r)^2} + \frac{S_3}{(1+r)^3} + \cdots + \frac{S_n}{(1+r)^n}$$

where C is the cash sacrifice.

S_1 is the net cash inflow for the first period, S_2 for the second period, S_3 for the third period, etc., for any number of periods, and r is the rate of return.

For a new investment, the cash sacrifice (C) is the purchase price plus delivery and installation costs. For an existing investment, the cash sacrifice is the net amount of cash which should be realized if the investment were liquidated. Single-purpose, specially-designed assets and assets which would be costly to remove tend to have very low, even negative, liquidation values. Such assets are likely to be kept for a considerable period of time since little is lost from not liquidating.

The net cash inflows (S) are gross cash savings or cash earnings generated by the asset, less all cash expenditures directly attributable to the operation of the investment,

including capital expenditures needed during the life of the investment. Any expenditure which would exist even if the investment were liquidated—such as most overhead items—would not be deducted. Non-cash expenses, such as depreciation, are not deducted, since such deductions would bias investment decisions in favor of investments which are either not depreciable or which can be depreciated on a straight-line basis only. Salvage value is added to the net savings for the last period being considered.

Mechanics of Determining r

Once data for net savings and cost have been assembled, the rate of return is determined arithmetically using an iterative, i.e., trial and error, technique. The true rate of return is that which will discount the net savings so that the total of discounted net savings equals the cash outlay (C).

1. Assume a rate of return, \bar{r} , and discount net savings with \bar{r} .
2. Total the discounted net savings. Let us call this total \bar{C} .
3. If \bar{C} is less than C , the assumed rate of return is higher than the actual rate of return. So, choose a lower \bar{r} and repeat steps (1) and (2).
4. If the new \bar{C} is greater than C , the second assumed rate of return is smaller than the true rate of return, and the true rate of return lies between the two \bar{r} 's. It is now possible to estimate (by interpolation) the true rate of return. While the first interpolated estimate may not be exact, one additional interpolation will almost always approximate the true rate of return plus or minus .001. Further accuracy can be had simply by additional interpolation.

This method does not result in a true rate of return since it embodies the implicit assumption that the cash inflows generated by the new investment are to be reinvested at the same rate of return as that earned by the new investment.⁶ As a result, the rate of re-

⁶ See the articles by Renshaw and Baldwin (cited in note 1).

turn experienced on the proposed investment may either exceed or be less than the rate calculated by the method suggested above. If the S's can be reinvested at a rate higher than that earned by the proposed investment, the actually experienced rate of return will exceed the calculated rate. If the cash inflows are to be reinvested at a rate lower than that calculated for the investment, the experienced rate will fall below the calculated rate. This argument, however, seems to have dubious practical significance. It envisions the art of forecasting developed to a point whereby it is not only possible to forecast the future dollar returns of an investment currently under consideration, but also the ability to forecast the return from an investment which will not be under consideration for perhaps several years and to forecast what the cost of funds will be several years in the future.

Such forecasting may be reasonably accurate for public utilities, but, for most industrial firms will contain so much error as to be useless. A more realistic approach is to accept the fact that the calculated rate of return is based on a forecast and that the forecast may be in error. Since this is always true, it is necessary to review the capital budget periodically, not only for new investments and new sources of funds, but also for existing investments and currently utilized sources of funds.

Economic Life of the Investment

As is well known, there is no necessary relationship among the various "life" concepts of an investment. Depreciable life is simply the number of years over which the Internal Revenue Service will allow a firm to amortize the original cost of an asset. Physical life is an almost meaningless concept. For example, most assets, unlike Holmes' "One Hoss Shay," do not disintegrate but can be rebuilt whenever needed and can last forever physically. The economic life of an asset is simply the period of time which will yield the highest return on the investment. In almost all cases, economic life will be shorter than physical

life and may be longer or shorter than depreciable life.

Clearly, the economic life is related to the rate of return. Given an asset for which the firm's planning horizon is 4 years, the asset may be held for all or any part of the 4-year period. The rate of return will be different depending upon the length of time over which the firm plans to hold the asset. The economic life can be determined simply by choosing that period of time for which the rate of return is highest. Thus if the rates of return are:

for 1 year	8%
for 2 years	15%
for 3 years	12%
for 4 years	6%

the economic life of the investment is 2 years.

Need for Re-evaluating Capital Investments

At any one time, a firm will usually have more funds "sunk" in existing capital investments than are available for new investments. To the extent that these existing investments can be liquidated and the released funds used in more profitable investments, the firm loses money by failing to apply the same profitability tests that are used to test the desirability of making new investments.

The amount of loss depends partly upon the stability of economic and technological conditions in both the firm's industry and in the general economy. Under rapidly changing conditions, an investment which once appeared highly profitable can quickly become relatively unprofitable. For example, an existing machine tool may become obsolete as the result of substantial technological changes. Or investments made for special purpose machinery may become unprofitable if consumer tastes change against the product of the special purpose machinery.

More generally, the need for re-evaluation of capital investments results from forecasting errors. The gross savings generated by the capital investment may have been incor-

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rectly forecasted as a result of poor economic forecasts. The predicted operating costs of the investment may be in error as a result of wage increases, bad engineering predictions, etc. Lastly, the cut-off rate for investments may have risen because of changes in the money markets.

Re-evaluation. If all of the forecasts were accurate in the original evaluation, the replacement point will occur at the end of the economic life of the asset. Thus, if the economic life of an asset were originally determined to be 2 years, and forecasts were actually realized, the firm would find that it would be unprofitable to replace the asset before the two years had passed and that it would be unprofitable to retain the asset after its economic life had expired.

Forecasts are rarely so accurate, however, that the firm can rest content in the certainty that replacement will not be required until the expiration of the originally calculated economic life of the asset.

To re-evaluate an asset after it has been acquired:

- The firm must calculate the net cash inflow that would occur if the asset were liquidated. In effect, this is the cost of keeping the asset.
- Expected net savings must be forecast, for the existing asset.
- A rate of return must then be calculated for the existing asset so that it may be compared with the current cut-off rate, as well as with new investment opportunities. A rate of return that is less than the rate of return on a new substitute asset indicates replacement, providing the rate of return on the new asset exceeds the cut-off rate.

Problems in Application

Forecasting. Without question, the greatest problem in this approach is forecasting. But this is the major stumbling block for all business decisions. Problem or not, forecasting is done either explicitly or implicitly regardless of whether the firm decides to

replace investments, to liquidate existing investments, or simply to stand-pat.

Data Collection. A related problem is the availability of historical information on existing assets. In order to make better forecasts of net savings, historical data based on cost accounting and engineering information must be accumulated regularly as part of the firm's control system. Most firms go to considerable pain in gathering data on new investments but are considerably more lax in gathering information about existing investments.

Interdependence of Invested Projects. In most operations, it is relatively easy to determine whether an existing machine should be replaced by a similar piece of equipment. That is, it is not difficult to determine whether the rate of return on an existing lathe is greater or lower than the rate of return on a new lathe. But since either the old lathe or a new lathe may be indispensable to the operations of the particular manufacturing unit, it may not be possible to decide to dispense with the lathe entirely. A textile firm which decides to dispense with looms because the rate of return on looms is less than the cut-off rate makes a decision which affects not only the looms, but also the other textile machinery which requires looms as complementary equipment in the manufacturing process.

The investment unit tested against the cut-off rate criterion must include all complementary equipment. What often happens is that a particular piece of equipment may seem unprofitable because its contribution to the profitability of other equipment has been ignored. A simple example occurs with office equipment. Any desk may appear to be relatively unprofitable. However, if the profitability of the entire office function to which the desk contributes is taken into account, then the need for the desk is clear. Thus, in making the calculations underlying re-equipment decisions, care must be taken to assure that the inter-relationships of equipment units have been considered.

As a result of both the problems of data

collection and the interdependence of investments, it probably is not feasible to use the broad replacement test suggested in this article for relatively small investments. Instead, I suggest that the replacement test be applied to such investments as an entire plant, an entire operation, or a product line. For the replacement of individual pieces of equipment, a narrower test⁷ to determine only the relative profitability of replacing with new but similar equipment is probably more practical.

Summary

Evaluation of capital investments is part of the capital budgeting procedure, the aim of which is to direct the capital program into the most profitable channels and to acquire investment funds from the cheapest sources. As part of the capital budgeting process, existing investments must be re-

evaluated in the same way as are new investments. This approach implies more than simply testing existing assets for purposes of replacement with a new similar asset, but raises the question of the desirability of maintaining a particular type of investment at all.

The method presented in this article is essentially the same as McLean's and Anthony's. The differences are as follows: a. Both McLean and Anthony assume a given economic life for the investment whereas we argue that the determination of economic life is part and parcel of the evaluation process; b. McLean does not deal with replacement at all; c. Anthony's replacement test tests only for replacement but does not test for the over-all desirability of the investment in either old or new equipment, i.e., Anthony's test is not part of the capital budgeting process.

APPENDIX

Numerical Examples of Equipment Calculations

Example 1. Ignoring Taxes and Depreciation.

Assume a new investment with the following projections of gross savings, cash expenses, net cash cost, and resale values.

YEAR	GROSS SAVINGS	CASH EXPENSES	RESALE VALUE AT END OF YEAR
1	\$500	\$100	\$500
2	500	200	450
3	500	300	350
4	500	400	200
5	500	500	50
6	500	600	50

Original Cash Cost—\$800

Step 1. Prepare discount equation for each relevant number of years. The relevant number of years is the number of years among which the firm must choose an economic life. A number of years is irrelevant if the sum of the undiscounted net savings plus resale value for that number of years is less than the sum for any fewer number of years.

⁷ See Anthony (note 1).

The relevant number of years among which the firm must choose is one year, two years, or three years. Since the undiscounted totals for holding the asset four, five, or six years are less than the total for holding the asset for three years, it follows that they need not be considered. The rate of return on these years must be less than the rate of return for holding the asset three years.

Step 2. Calculate the rate of return if the investment is held for only one year.

$$\begin{aligned} \$800 &= \frac{\$900}{1+r} \\ \text{or} \\ r &= 12.5\% \end{aligned}$$

Step 3. Using 12.5%, discount the net savings if the investment is held for two years. If the sum of the savings discounted by 12.5% is greater than \$800, the rate of return for holding the investment for two years is less than 12.5% and it is not necessary to calculate the true rate. Then try 12.5% on the savings for three years. If the sum of the discounted savings for three years is less than

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NET SAVINGS AND RESALE VALUE IF HELD FOR:

Year	1 yr.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	6 yrs.
1.....	\$900	\$ 400	\$ 400	\$ 400	\$ 400	\$400
2.....		750	300	300	300	300
3.....			550	200	200	200
4.....				300	100	100
5.....					50	0
6.....						- 50
Totals Undiscounted.....	\$900	\$1, 150	\$1, 250	\$1, 200	\$1, 050	\$950

NET SAVINGS AND RESALE VALUE IF HELD FOR:

Year	1 yr.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	6 yrs.
1.....	\$850	\$300.00	\$300.00	\$ 300	\$300.00	\$300.00
2.....		687.50	250.00	250	250.00	250.00
3.....			512.50	200	200.00	200.00
4.....				250	100.00	100.00
5.....					37.50	0.00
6.....						-62.50
Undiscounted Totals.....	\$850	\$987.50	\$1, 062.50	\$1, 000	\$887.50	\$787.50

\$800, the rate of return for three years is less than 12.5% and the economic life of the asset would be one year with a rate of return of 12.5%.

If the sum of the discounted savings at 12.5% for either two or three years exceeds \$800, the true rate of return for two or three years is greater than 12.5% and must be calculated.

$$\bar{C} = \frac{\$400}{1.125} + \frac{\$750}{1.266}$$

$$C = \$356 + \$592$$

\bar{C} =\$948 which is greater than \$800. Thus the true rate of return if the asset is held for two years is greater than 12.5%. To determine the true rate of return for 2 years, we shall try a \bar{r} of 25%.

$$\bar{C} = \frac{\$400}{1.25} + \frac{\$750}{1.56}$$

$$\bar{C} = \$313 + \$480$$

$$\bar{C} = \$793$$

Interpolating between the \bar{C} calculated with 12.5% and the \bar{C} calculated with 25%, a new

\bar{r} can be estimated of 25%—7/155 (12.5%) or approximately 24.3%. Although this would be sufficiently accurate for most instances without further calculations, we may test 24.3% for purposes of example.

$$\bar{C} = \frac{\$400}{1.243} + \frac{\$750}{1.545}$$

$$\bar{C} = \$322 + \$485$$

$$C = \$807$$

Interpolating, \bar{r} may be estimated at 24.3% + 7/14 (.7%) or 24.7. The perfectly precise rate lies between 24.6% and 24.7% and can be found by further interpolation if desired.

Step 4. Since the rate of return for two years exceeds that for one year, the 24.7% rate must be tested on the savings for three years. The procedure is the same as described in Step 3.

$$\bar{C} = \frac{\$400}{1.247} + \frac{\$300}{1.555} + \frac{\$550}{2.039}$$

or

$$\bar{C} = \$322 + \$194 + \$270$$

$\bar{C} = \$786$ which is less than \$800 so the true rate of return for three years is less than 24.7%.

Thus, the economic life of this investment is predicted to be two years and its rate of return is estimated to be 24.7%. The investment will be undertaken only if the cut-off rate is less than 24.7%.

It may be well at this point to indicate the difference between this method of evaluating new investments and other methods.⁸ The primary difference is that no assumption is made about the economic life of the asset. As a result, replacement considerations become a part of the evaluation of the investment from the start.

To re-evaluate the equipment, assuming forecasted values have remained unchanged, the technique is identical to that used in the initial evaluation above. Of course, some of the data change.

At the end of the first year, the asset would be re-evaluated in the following manner. The cash sacrifice is defined as the net resale value of the asset plus any cash expenditures that may be required to keep the asset serviceable, such as major repairs, etc. In the example, the resale value at the end of one year is \$500. If the asset is kept for one year more, the rate of return for the additional year is calculated as follows:

$$\begin{aligned} \$500 &= \frac{\$750}{1+r} \\ \text{or} \\ r &= 50\% \end{aligned}$$

Would it be more profitable to hold the asset for two more years? To test this, the formulation is

$$\bar{C} = \frac{\$300}{1.5} + \frac{\$550}{2.25}$$

$\bar{C} = \$200 + \$245 = \$445$ which is less than \$500 so that it is more profitable to hold for only one more year. In terms of replacement, if a new asset had a maximum rate of return of only 24.7%, it obviously is not profitable to

replace at this time. Replacement would take place only if the rate of return on a new asset or the cut-off rate exceeded 50%.

At the end of the second year, again assuming unchanged forecasts, cash outlay will be \$450 if the asset is to be held beyond the second year. The test to hold for one more year is

$$\begin{aligned} \$450 &= \frac{\$550}{1+r} \\ \text{or} \\ r &= 22.2\% \end{aligned}$$

If the new replacement has a rate of return of 24.7%, the asset will be replaced at the end of the second year providing the cut-off rate is less than 24.7%. In other words, if forecasted values are realized, the firm will not only have estimated the rate of return on the asset when it was new, but it would have simultaneously forecasted the replacement period. Among other things, such a forecast may be very useful in projecting working capital needs.

If forecasts are not realized, the same calculation procedures still apply. At the end of one year, it may be found that the original forecasts had been wrong. Corrected forecasts can then be made and the new data inserted in the replacement test.

As a very simple example, assume that the resale value at the end of one year has been changed to \$700 from \$500 but that nothing else has been altered. The rate of return for the asset if it is held for one more year is

$$\begin{aligned} \$700 &= \frac{\$750}{1+r} \\ \text{or} \\ r &= 7.1\% \end{aligned}$$

The rate of return on an identical replacement would have changed also. If a new identical asset were purchased, its rate of return if held for one year would be

$$\begin{aligned} \$800 &= \frac{\$1,100 \text{ (reflecting the higher resale value at the end of one year)}}{1+r} \\ \text{or} \\ r &= 37.5\% \end{aligned}$$

⁸ Dean, Anthony, and McLean (note 1).

If held for two years, the rate of return for the new asset would be 24.7% unchanged because the change affected the resale value at the end of the first year only. As a result of the change, the firm would replace its old asset at the end of the first year. The replacement asset would have a forecasted rate of return of 37.5% and an economic life of one year.

Thus the replacement method is flexible. It provides a way in which changes in forecasts can be introduced and decisions changed even after the original asset has been purchased. Any workable replacement test must be able to do this.

Example 2. Impact of Taxes and Depreciation.

The introduction of taxes and depreciation does not alter the calculation method at all, although the decision may be altered as a result of the new factors. What is altered is the computation of net savings and resale values. Assume an income tax rate of 50%, a capital gains rate of 25%, no tax-loss carry-forward or carry-back, and straight-line depreciation. Using the same example as before with the assumption that the depreciable life of the asset is four years, the after-tax cash inflow of the asset if held for only one year is as follows:

NET SAVINGS AFTER TAXES

Net savings after cash expenses, before depreciation and taxes	\$400
Depreciation (\$800/4 years)	200
Taxable savings	<u>\$200</u>

CAPITAL GAIN OR LOSS ON RESALE VALUE

LESS CAPITAL LOSS

Resale value	\$500
Book value of asset when liquidated	600
Capital loss	<u>\$100</u>

NET CASH INFLOW AFTER TAXES

Taxable savings	\$200
Less capital loss	100
Taxable income	<u>\$100</u>

Taxes	50
Savings after taxes	<u>\$150</u>
Depreciation	200
Resale value	500
After tax net cash inflow	<u>\$850</u>

The rate of return if the asset is held for one year is approximately 6.3%. The net savings for the two years, assuming the asset to be liquidated at the end of the second year, are calculated as follows:

FIRST YEAR

Net savings after cash expenses, before depreciation and taxes	\$400
Depreciation	200
Taxable	<u>\$200</u>
Tax (50%)	100
After tax	<u>\$100</u>
Plus Depreciation	200
After tax net savings for first year	<u>\$300</u>

SECOND YEAR

Net savings after cash expenses, before depreciation and taxes	\$300
Less Depreciation	200
Taxable Savings at Ordinary Rate	<u>\$100</u>
Resale value	\$450
Less Book value	400
Capital gain taxable at capital gains rate	<u>\$ 50</u>
Taxable at ordinary rate	\$100
Less tax (50%)	50
After taxes	<u>\$ 50</u>
Taxable at capital gains rate	\$ 50
Tax (25%)	12.50
After taxes	<u>\$ 37.50</u>
After tax savings	\$ 50
Plus Depreciation	200
Total	<u>\$250</u>
Plus resale value	450
Total	<u>\$700</u>
Less capital gains tax	12.50
Net savings and resale value after taxes	<u>\$687.50</u>

Given the newly calculated net savings + resale values, the capital budgeting tests would be the same as in the previous example. The obvious difference is the added problem of calculating taxes and depreciation. The aim is to derive a figure which represents the net cash inflow for the appropriate periods. The net savings and resale values are shown in the following Table:

NET SAVINGS AND RESALE VALUE
IF HELD FOR:

Year	Gross Savings	Cash Expenses	Resale Value at End of Year
1	\$500	\$100	\$500
2	500	200	450
3	500	300	350
4	500	400	200
5	500	500	50
6	500	600	50

Original Cash Cost—\$800.

If there is a "secret" of success, it is the appreciation of what one has the ability to do, plus the recognition of opportunities when they appear, and a healthy satisfaction with what is achieved by closely coordinating ability and opportunity.

Arnold Bennett

Market Measurement in A Free Society

RALPH CASSADY, JR.

A discussion of methods by which consumer wants and buying patterns, variable and uncontrolled in a free society, are discovered and measured.

In a free society, some knowledge of consumer demand is not merely desirable but an absolute necessity if vendors are to be successful.¹ Those offering goods and services must know not only the type of merchandise desired by consumer-buyers, but also the style of item preferred, the amount consumers will take, the nature of service desired, where consumers can expect to buy the product, the particular time the item is required, and how much prospective buyers will pay for it. It is only after knowing these things that vendors can safely attempt to promote the sale of their merchandise offerings without incurring losses due to consumer resistance.

The key to intelligent competitive activity is market research which seeks information about consumer wants and behavior patterns to serve as a basis for effective marketing activity.

How the Market Is Investigated

There are, of course, various methods of obtaining market information available to those who undertake the responsibility of providing for consumer wants. It is the main purpose of this paper to consider such procedures and to relate them to various specific marketing problems.

Before examining the several market research methods in detail, a number of preliminary points should be made about market research as compared with other types of scientific investigation.

¹ The only exception to this is in a sellers' market when the competition for supplies of goods is much more intensive than the competition for customers, e.g., in wartime.

Basic Research Methods

As in every other field of knowledge, only a limited number of basic research methods are available to the investigator who is interested in probing markets. This is not to say that there are not innumerable research techniques available for use in our investigatory activity, but only that various devices possess basic characteristics which permit classification into only one of a very few categories.

While hypothesis-testing² is used as a research device in economic (including market) analyses, its use is not as extensive as in some other areas. One reason for this, perhaps, is that the state of knowledge in the marketing field is such that research has been confined largely to exploratory investigation, and less emphasis has been placed on precise explanations for various developments.

It is in this latter phase of research activity that hypotheses are most useful. One might add that those engaged in economic investigations often appear to confuse hypotheses (tentative explanations) with theory (confirmed generalizations).

In economic investigations, heavy reliance is placed on inference for conclusions. This is due, in part at least, to the difficulty of employing experimentation in this field. For example, if in an analysis of market data a marked change appears in the statistical pattern, which upon further analysis is found to

² According to Webster's (*Webster's New International Dictionary*, 2nd ed., Unabridged) a hypothesis is "2. A proposition, condition, or principle which is assumed, perhaps without belief, in order to draw out its logical consequences and by this method to test its accord with facts which are known or may be determined."

coincide with a particular development that reasonably could have had an effect on the results, an inference is apt to be drawn that it did indeed have such an effect.

But research which leads to inferential conclusions is not unique to economic analysis. It will be recalled that the cigarette-lung cancer researches have thus far been mostly statistical, with inferential conclusions being based upon the apparent relationship between heavy smoking and the incidence of this disease.

While statistical studies may result in a strong inference toward a cause and effect relationship between cigarette smoking and lung cancer, the heavy smoking and the cancer might conceivably both stem from a common cause. Hence experimentation must be employed to confirm or invalidate the hypothetical conclusion that heavy smoking is the causal factor.³

Market researchers must, in large part (as in some other new areas of investigation) devise their own apparatus for market-measurement purposes. The mark of a good research man in this field is his ability to design effective methods of measuring various market phenomena, such as buying habits, brand preferences, market potentials, etc. Thus, over the years, there have been contrived all kinds of ingenious devices for measuring market behavior, including pantry surveys (which serve as the basis for drawing inferences concerning consumer brand preferences), mechanical recorder attachments for radios and television sets (which reveal the listening and viewing habits of householders), retail-store brand-preference audits (which reflect consumer buying habits), consumer diaries (which provide invaluable information concerning buyer preferences and practices), and automobile license number studies (which reveal much information

about consumer patronage habits in relation to various retail institutions).⁴

Research methods in the marketing field as in other disciplines may be classified as deductive (seeking answers by the application of logic to a problem) and inductive (seeking answers by empirical study of the problem).

Deductive Analysis

Although stress in market research is laid on inductive investigation, those who are well versed in research methodology do not "look down their noses" at deductive analysis. Deduction is an extremely effective supplementary research tool. Indeed, inductive research would lose much of its effectiveness without the aid of deductive analysis.

Some deductive activity is merely hypothesizing,⁵ designed either to provide tentative explanations of certain phenomena or to suggest a possible behavior pattern, say, which might be subject to test later on. However, deductive investigation may extend knowledge at least in the sense of making clear the full implications of inductively-established conclusions.

Thus deductive analysis may serve at least three purposes in market investigation:

1. It may suggest hypothetical relationships whose actual existence may be later subject to test through inductive means.
2. It may provide tentative explanations of phenomena which may later be confirmed or vitiated through inductive study.
3. It may make possible the extrapolation of knowledge gained from inductive investigations by providing inferential conclusions based on fact-founded premises.

There has been considerable advancement in our thinking concerning buyer attitudes and competitive behavior at the abstract level during the past 25 years as a result of investigative effort which might reasonably be classed as market research. Thus, the work

³ A difficulty here might be the devising of experimental methods which would not endanger the health of human "guinea pigs." This does not mean, however, that investigations that endanger health are precluded. It will be recalled that Dr. Walter Reed made use of volunteers in his famous yellowjack investigations of sixty years ago which were designed to test the hypothesis that mosquitos were carriers from which infection resulted.

⁴ See Ralph Cassady, Jr. and Harold M. Haas, "Analyzing the Market of Mail Order House Retail Stores," *Harvard Business Review*, Summer, 1935, pp. 493-502.

⁵ See footnote 2.

of Prof. Edward H. Chamberlin and Mrs. Joan Robinson is based almost entirely on deductive analysis and, while still largely hypothetical, has led to the development of the area of nonperfect competition with its classification based on variation in numbers, differentiation of product, and amount of market information in possession of buyers and sellers.

The author's own studies have been in part deductive in nature also. For example, some years ago, J. M. Clark published a trail-blazing article on what he called "workable competition."⁶ In this presentation Prof. Clark suggested the possibility (or perhaps better, the probability) that elasticity of demand was substantially conditioned by the passage of time.⁷ This led to a great deal of reflection by this author on the time element as it affects consumer demand, and ultimately to a publication of his views.⁸

While these hypotheses are still subject to confirmation, some headway has been made by isolating the issues and thus simplifying the task for the inductive investigator and indeed in informing practical marketing executives about probable consumer behavior patterns.

To take another example, this author was a participant in a recent international roundtable on fisheries and fishery products. The discussion included the nature of the demand for fish by American consumers. One part of the analysis was concerned with cross-elasticity of demand between fish and meat (i.e., the impact on the sale of one product resulting from a change in the price of another).

Ordinarily, a high degree of cross-elasticity between two competing products would mean that when the price of one goes up the amount taken of the other increases and vice versa. Fish, however, is considered by Americans to be a second-class food and

hence—according to this hypothesis—cross-elasticity would appear to be much lower when a change in price favors fish than when a change in price favors meat.⁹

While this hypothesis still remains to be tested, the formulation of the hypothetical proposition is a definite step toward the solution of the problem because it isolates the question which needs to be answered and prevents wasted investigatory effort. Although no suggestion is being made at this time regarding a scheme which one might use to test this hypothesis, there is little doubt that a testing device can be devised in time.

It is this writer's opinion that even without confirmation deductive analysis may be valuable because of the fact that it provides the practitioner with a suggestion as to possible behavior patterns that might alert him to potential dangers and opportunities. The possibility for instance that the impact of a price change will be greater over time than it is at the moment the change is made may be of great significance to those engaged in actual market operations.

Similarly, practitioners stand to gain greatly from a hypothetical finding that consumer demand for various products and services may vary greatly during a day or week and that greater response can be expected to the offerings of vendors if consideration is given to the place where consumers are when they feel the need of the item most keenly.¹⁰

Inductive Analysis

Despite the valuable contributions of deductive analysis, the large bulk of market research activity is inductive in nature. That is, findings are the result of actual market investigation. While the methods utilized in field study differ greatly in details, basically there are only three inductive approaches

⁶ J. M. Clark, "Toward a Concept of Workable Competition," *The American Economic Review*, June, 1940, pp. 241-256.

⁷ See p. 247 of footnote 6.

⁸ See Ralph Cassady, Jr., "The Time Element and Demand Analysis," Cox and Alderson, eds., *Theory in Marketing* (Chicago: Richard D. Irwin, Inc., 1950), pp. 193-207.

⁹ Ralph Cassady, Jr., "The Marketing of Fishery Products in the United States," Turvey and Wiseman, eds., *The Economics of Fisheries* (Rome: Food and Agriculture Organization of the United Nations, 1958), p. 201.

¹⁰ E.g., ice-cold "Coke" in service stations and places of work.

available to market researchers.¹¹ These will be discussed briefly in the following paragraphs.

Observational Method

Under this scheme (which is, of course, relied on very heavily by astronomers) information is derived either directly or indirectly by observing and recording the phenomena under study, for example, the behavior of people who are going about their normal daily tasks—preparing meals, keeping house, listening to the television, moving about the community, shopping, performing marketing functions, etc. As was suggested immediately above, observation may be performed directly in a first-hand manner or it may have been performed by someone else at an earlier time and only later reported by the observer as a result of second-hand investigation.

Direct Observation

In the use of this approach, observations are made at the time the event is taking place. For example, an observer at some carefully-selected vantage point is able to tell a great deal about consumer acceptance of a particular style (e.g., the number of men out of every hundred wearing Homburg hats). The author participated in a foot-traffic study for a certain location on Market Street in San Francisco some years ago in order to determine, by actual count, the types of persons passing by the place under study and the time of passing. This information then could be utilized as a basis for deciding the most effective use of the retail location under study.

Similarly, a tabulation of automobile license numbers found in parking lots of two Midwestern retail establishments yielded vast amounts of useful market information, such as the number of patrons at different times of the day and week, the distances traveled by customers from home to the

store, and (determined from the location of the home of each car owner) the estimated income bracket of the patrons.¹²

One recently-reported application of the direct observational method in American business is the use of a one-way mirror (so-called) to permit a study of the reactions of children to various types of toys with which they have been invited to play, without awareness on their part that they are being observed.

Diary studies, based on detailed records of consumer purchases and commonly used by market researchers to derive information about family living and purchasing habits, are basically similar to the schemes just discussed except that the diarist is often both the observer and the observed.

Indirect Observation

Under this scheme, observations are made after the event has taken place (although some recording of events might have taken place earlier) and reliance is placed on existing evidence of what has occurred in the past rather than on personal observation of the event as it occurred. Essentially, this is feasible because past developments usually leave in their wake some evidence in the form of records or reports by participants or primary observers which may be utilized as a basis for determining what took place at an earlier time.¹³

The indirect observational method may be classed either as qualitative or quantitative.

Qualitative Investigation

In this type of investigation the information the researcher is attempting to obtain concerning past events is essentially subjective rather than statistical in nature. Some of our historical studies are essentially taxonomic—that is, their contribution to understanding is based largely on the systematizing of the

¹² On a basis of the relationship between income and housing cost. See footnote 4.

¹³ It should be noted that the indirect observational method is so designated because the researcher does not observe phenomena directly but reports on the observations that someone else has made.

¹¹ The author is indebted to Professor D. M. Phelps for his extremely able analysis of marketing research methodology as described in *Marketing Research* (Ann Arbor: University of Michigan Press, 1937).

information gathered so as to make such data more comprehensible and thus applicable in planning market strategy.¹⁴

A qualitative study of the Los Angeles wholesale grocery trade several years ago revealed the evolutionary change from the full-service type of operation to the limited-function method of food distribution which, of course, is a reflection of changing consumer patronage habits.¹⁵ Similarly, the writer has been working recently on a study of price warfare (including consumer behavior patterns found therein) in which he relies to some extent on records of past events. These records may in turn be in the form of second-hand observations rather than reports by direct observers at an earlier time.¹⁶

It is sometimes possible to interview direct observers simultaneously with the unfolding of the event observed (e.g., interrogating those actively engaged in a price war). However, there is a question as to whether participants in particular economic behavior situations (such as price warfare) should be interviewed *during* such altercations or after they are concluded.

Some argue that the former is the correct approach because the events are fresh in the minds of the participants and the researcher is therefore likely to get a more accurate appraisal of conditions and motivations. However, a major objection to this approach is that participants' views may be distorted by emotional reactions and, indeed, such individuals may be reluctant to tell the whole truth when the outcome of the struggle might be affected by such a revelation.

Qualitative historical research results may have commercial as well as pure research value. For example, some business concerns

¹⁴ See, for example, Ralph Cassady, Jr., "Techniques and Purposes of Price Discrimination," (*The Journal of Marketing*, October 1946, pp. 135-150) which is essentially a classification of price discrimination methods employed by various types of individuals and firms in the business and professional world.

¹⁵ See Ralph Cassady, Jr. and Wylie L. Jones, *The Changing Competitive Structure in the Wholesale Grocery Trade* (Berkeley: University of California Press, 1949).

¹⁶ See, for example, a description of the Santa Fe-Southern Pacific rate wars of the mid-eighties found in Glenn S. Dumke, *The Boom of the Eighties in Southern California* (San Marino: Huntington Library, 1944), pp. 17-27.

have made use of analytical studies of certain types of existing legal restrictions on selling activities, with the purpose of establishing a basis for planning future market strategy. By knowing the nature of the legislative restrictions which condition a firm's activities in relation to consumer-behavior patterns, management may be able to make a more intelligent decision as to whether it should attempt to meet consumer needs through its own method of operation or to withdraw from the particular field. Indeed, the firm may actually choose to remain in the field and seek some easing of the restrictions through the legislative process.

Quantitative Investigation

The market information sought by quantitative studies is essentially statistical in nature. One interesting application of this type of investigation to market-measurement problems is an analysis which was made of the shift of retail trade of a large metropolitan area from the central shopping district to outlying areas. This investigation was conducted by recasting Census of Business data from political subdivisions to economic subregions, thus providing a basis for measuring the movement of trade from one time to another.¹⁷

Similarly, some years ago a study was conducted of the seasonal behavior of apple prices to serve as a basis for a top-level executive decision in a large food chain organization. This analysis, which was predicated on published auction price statistics, had the specific purpose of providing an answer to the question as to whether a large food firm might find it more profitable to acquire title to supplies of this type of product early in the season rather than to continue purchasing the goods as needed on a hand-to-mouth basis.

It should be obvious that if conclusions are to be drawn regarding general behavior pat-

¹⁷ See William K. Bowden and Ralph Cassady, Jr., "Decentralization of Retail Trade in the Metropolitan Market Area," *The Journal of Marketing*, January, 1941, pp. 270-275, and Ralph Cassady, Jr. and W. K. Bowden, "Shifting Retail Trade Within the Los Angeles Metropolitan Market," *The Journal of Marketing*, April, 1944, pp. 398-404.

terms which are to be considered generally applicable to other similar situations, the historical data chosen for observation must be properly representative of the whole universe under study.

Interrogation Method

This approach is relied on very heavily by researchers who inquire into human behavior and motivation (e.g., psychologists). Some types of market information cannot readily be acquired except by the use of such techniques. For example, a person's income (and hence his purchasing power) may not be accurately obtainable by observation (although, of course, certain inferences might be drawn regarding this matter on a basis of one's occupation or place of residence). Thus investigators must resort to interrogation if adequate information is to be obtained.¹⁸

The survey method of research (as it is sometimes called) relies not on observing what people do but on gathering information which reposes in people's minds and which must be acquired by questioning individual respondents. A large part of market research, of course, is based on the use of this general method of investigation.

Information which may be obtained by survey techniques includes the number of persons in various age groups. For example, the number of youngsters between 10 and 14 years of age might serve as a basis for estimating the market for some proposed children's magazine. Information may be obtained concerning individuals' reading habits, brand preferences, patronage habits, motivational influences, and future purchasing plans by survey also.

Just as in the observational approach, great care must be taken to obtain scientifically selected samples in survey studies.

¹⁸ It must be admitted that there is a danger of upward bias in attempting to gain information about incomes through interrogation, due to the element of prestige which is connected with high incomes, although this would depend to some extent at least on the agency collecting the data. (Some companies no longer require job applicants to list salaries earned on former jobs, since it has been found that these are frequently overstated by a \$1,000 a year or more.) The U. S. Bureau of Census can undoubtedly obtain income data in its sample studies with a certain degree of accuracy.

This is a highly technical procedure and requires a great amount of skill if sound results are to be obtained. In addition, however, it is necessary to prepare properly constructed questionnaires and to select and train skilled field personnel.

Simple Interviewing

In this type of procedure the questions to be asked are predetermined and precisely stated and the interviewer is not permitted to depart from the schedule of queries previously prepared. Care must be taken to ask questions which will elicit from the respondent the desired information with the least amount of bias or distortion.

A simple question in a gasoline patronage study, asking for the brand of gasoline purchased most recently and in which station it was purchased, should yield sound and valuable market information. Likewise, questions concerning the brand of shortening the housewife has on hand should produce equally successful results. Questions concerning the television program which one watched at a specified recent time should also result in the required information. (It is interesting, incidentally, that the latter type of information might be obtained through observational methods; i.e., a recording device can be attached to the television chassis.)

The interrogation method was utilized several years ago in a study of consumer meat-purchasing habits in a Midwestern community to determine to what extent consumer buyers shift their patronage from one institution to another in accordance with lower prices offered, as a basis for a defense against a charge of violation of a "cost floor" act.¹⁹

Depth Interviewing

It is well recognized by competent market researchers that motivation cannot be ac-

¹⁹ The point here was that such legislation typically permits the meeting of competitors' lower prices for comparable merchandise, but the question in this instance was whether consumers might not shift patronage in response to lower prices for an inferior product, and hence the firm selling the superior product might have to protect its position by offering its product at lower prices.

curately determined by ordinary questioning, either because respondents do not know why they behave as they do or because they do know but are reluctant to tell. Motivational research techniques are those which are designed to determine why who does what when. The depth interviewing technique, undoubtedly borrowed from the psychoanalyst (who in turn borrowed it from the anthropologist), is designed to overcome the limitations inherent in simple (closed-end) interrogation. In this technique, questions to be asked are only generally outlined with the expectation that the subtle aspects of the respondent's behavior will be discovered by intensive discussion. Thus, by skillful probing, reluctance of respondents is overcome and memories refreshed.

Deep-seated information concerning preferences for certain brands of a particular food item may be discovered by means of depth-interviewing techniques.²⁰ A survey of Palm Springs pay-television subscribers several years ago elicited interesting and extremely valuable information concerning consumer attitudes on subscription television service which may be applicable generally. Thus, depth interviewing makes possible the substitution of basically sound responses for "top-of-the-mind" answers.

Experimental Method

Experimentation which is employed so extensively in certain of the physical sciences (e.g., chemistry), also may be advantageously employed by investigators into market phenomena. Experimentation—in a broad sense at least—may under certain circumstances be classified as an observational type of investigation, but is distinguished from the first-named approach by the fact that in the experimental scheme test conditions are pre-

arranged. Thus, people are observed not as they go about their normal tasks but in an artificial situation devised for the particular purpose. This procedure may be classified as either simple or controlled.

Simple Experimentation

This term suggests that the experiment is not controlled—that is—no attempt is made to provide a bench mark of normal expectation against which results may be measured. For example, a firm might simply wish to find out whether a certain demand manipulative scheme is likely to be successful. By the use of a consumer jury technique, it is possible to determine which of a number of different sales appeals is most attractive to consumer buyers. Or a firm, in bringing out a new brand of shaving cream, may desire to test the item simply by providing a sample of the proposed product to a panel of consumers and probing their reactions to the new item.

There are innumerable other applications of simple experimentation in market research. For example, a large retail concern may wish to test the efficacy of telephone selling by store employees. Such a test can be conducted by selecting the names of a certain segment of its charge list to whom the phone calls might be made announcing certain special offerings. Purchases of all such individuals then may be recorded and, on a basis of sales results, the promotional device evaluated. An interesting application of the technique has been employed also in the entertainment field in probing audience response to a presentation by instructing panel members to express their reactions to a test performance through the use of a recording device.²¹

Simple experimentation may be used in pricing studies also. The head of an outstanding American market research organization devised a scheme some years ago which was designed to aid in the pricing of a new brand or make of product. This scheme

²⁰ The results of one such study are given in an article by William F. Brown, "The Determination of Factors Influencing Brand Choice" (*The Journal of Marketing*, April, 1950, pp. 699-706). For additional information on depth interviewing see the American Marketing Association's Research Committee report, "Depth Interviewing," in the same issue of *The Journal of Marketing*, pp. 721-724, and L. M. Paradise and A. B. Blankenship, "Depth Questioning," *The Journal of Marketing*, January, 1951, pp. 274-288.

²¹ For further information on this method see Ralph Cassady, Jr., "Statistical Sampling Techniques and Marketing Research," (*The Journal of Marketing*, April, 1945, p. 339).

called for a panel of consumer jurors to evaluate the new brand against competitive offerings.²² The new article, unpriced, was available for examination by the jurors along with the products with which this item might be expected to compete.²³ Thus each consumer juror "priced" the product in comparison with the standard composed of all competitive items in the field.

While a control in the usual sense was absent in this experiment, a standard was provided against which consumers could evaluate the new item. It is interesting, as a side-point, that the results of such an experiment might provide the vendor with an approximation of a miniature demand curve for his product.

Each of these schemes, it should be noted, is based on some sort of prearrangement of conditions but is uncontrolled. While some types of experimental investigations may not require controls for sound research results (see above), some do. The *sine qua non* of some investigations is an evaluation of the impact of a particular stimulus on market results. In such investigations, the absence of some sort of control is a serious flaw because without it, it is impossible to isolate the stimulus under study from other stimuli which may have a simultaneous effect on market results.

Controlled Experimentation

The aim of controlled experimentation is to keep all stimuli precisely the same in the experimental as well as in the control group, except the one whose effect is being studied, so that the results from the one stimulus can be distinguished from those of others. Referring to the telephone sales study mentioned above: How is one to tell that sales made to those telephoned *resulted* from such calls when some of the individuals might have visited the store and purchased the

merchandise even in the absence of the specific stimulus under study?

It is not enough to know what the sales were in a pretest period, and to assume that any increase in the test-period sales resulted from the stimulus under test, because other stimuli (such as seasonal or industrial changes) might have occurred simultaneously and these may have caused *all* sales to increase at this time. As a basis of measuring the results of a specific stimulus (telephone calls to test group), one must compare results with the purchasing behavior of a control group made up of individuals of the same type in all respects except that they have not been subjected to the specific stimulus under study (i.e., telephone solicitation).

To take another example: A company might wish to test a formula of a proposed product by providing panel members with supplies of the item under consideration along with supplies of the leading brand in the field in masked containers as a sort of "control,"²⁴ after which panel members may be questioned concerning preferences, and observations can be made of remaining amounts of product.²⁵

And still another: A firm might wish to determine to what extent (if at all) a counter display rack would enhance sales for a particular brand of product, for example, razor blades. To determine effectiveness of the rack, sales might be recorded in a store selected for the purpose during a pretest period and then be compared with sales of the store during the test period. But the use of another store (similar in all respects to the first except that no display rack is utilized) would serve as a control which would make possible the isolation of the sales resulting

²⁴ This type of experimentation has certain limitations. For example, its use is greatly restricted if not actually precluded in some fields (such as drugs) by legislative circumscriptions. However, this type of test may have applications in certain lines which do not appear to be promising (appliances, say), although experimental conditions must be adapted to the peculiar circumstances of the product under study.

²⁵ It should be noted that what panel members may say about their preferences may not jibe with the consumption habits as evidenced by residual amounts of product. When such a correlation is absent, it may reveal certain very subtle preference patterns (such as liking ease of preparation but disliking the flavor) of the product under consideration.

²² See Wroe Alderson, "New Applications for Market Research," *Sales Management*, February 1, 1947, p. 46.

²³ It is not clear from Alderson's brief description of the experiment (See footnote 22) whether the prices of the competing products were indicated to panel members, but the present author would be inclined to believe that best results would be obtained if such prices were available to the test group.

from the use of the display rack from those resulting from other existing stimuli.²⁶

Controlled experimentation also lends itself to studies of the effectiveness of alternative prices and pricing arrangements.²⁷ For example, a chain store organization may wish to know the most effective price to charge for a single unit of a specific item or for a multiple offering of the same item.

The question of a multiple offering may involve subquestions regarding the effectiveness of a multiple offering *per se* (where the price charged for the group as a whole is the same as the price of the individual unit times the number of units making up the group) as compared with multiple-unit offerings where the total price of the group reflects discounts for quantity. If the regular price of the item were 10 cents, the problem might indeed be to determine what sales results might be expected from offering the item at two for 20 cents, at 9 cents per unit, at two for 18 cents, or at two for 19 cents.

In order to obtain a definitive answer to this problem, several cooperating stores must be used, including the control store (at which the regular price is charged).²⁸

This method might also be used in solving other market-measurement problems. These could include packaging problems (consumer preferences for tin versus glass containers, or mesh sacks versus paper bags, etc.), and shelving of merchandise (position in relation to eye-level, location of goods in relation to a family of related items, amount of shelf frontage for each item, etc.). It might, in addition, be used to study the effect of the introduction of new products (impact on any competing items already in stock as well as on related items), and improvements in store equipment (effectiveness in serving consum-

ers resulting from mechanized check-out stands). Undoubtedly, controlled experimentation techniques may be utilized in other studies of consumer behavior and response.²⁹

Controlled experimentation in market research is not confined to sales-test studies. The projective technique (which is designed to elicit uninhibited judgments from those under study) might be considered an example of controlled experimentation. In this scheme, the respondent is asked to project himself or herself into situations which are different in only one respect, and to interpret given phenomena, thereby disclosing deep-seated attitudes or motives of such individuals.

For example, if one wishes to determine secret or subconscious consumer attitudes toward instant coffee, he might (as one researcher did)³⁰ prepare two lists of food items precisely the same in every respect except for the inclusion of instant coffee in one and regular coffee in the other, and ask respondents to characterize the persons who purchased each group of food items. From the respondents' attitudes toward the purchaser of a certain type of item one can infer attitudes toward the item itself.

The scheme makes possible the discovery of biases which might not be readily revealed otherwise because ostensibly the respondent is not making a self-analysis but rather an evaluation of others, and, moreover, it isolates the respondent's attitude toward the item under test by controlling all conditioning stimuli except this one. A similar scheme has been used to test the inner attitudes of housewives toward trading stamps.³¹

One final point might be made *re* the use of controlled experimentation in market re-

²⁶ The difficulty, of course, is to find stores which are sufficiently similar to one another (in sales, location, type of patronage, etc.) to be used as a basis of comparison.

²⁷ William Applebaum and Richard F. Spears, "Controlled Experimentation in Marketing Research," *The Journal of Marketing*, January, 1950, p. 513.

²⁸ The result must, of course, be measured by the percentage change in sales between the pretest and test periods. Generally speaking, if a change in the number sold is no greater in test stores than in the control store, it indicates that the change in prices was not the causal factor.

²⁹ Pp. 512-515 (See Footnote 27).

³⁰ The results of such an experiment (Mason Haire, "Projective Techniques in Marketing Research," *The Journal of Marketing*, April, 1950, pp. 649-656) indicate that (a) instant coffee on food lists is viewed by certain respondents as evidence of laziness on the part of the housewife (p. 653), and (b) this attitude is fairly deep-seated because respondents having such views do not purchase the product themselves (p. 655).

³¹ Bertrand Klass, "The Controversies Surrounding Motivation Research," *Proceedings of the Fourth Annual Meeting—Social Science for Industry* (Menlo Park: Stanford Research Institute, April 4, 1956), pp. 46-47.

search: While the concept of control is very simple, the effective application of this scheme to market research problems is extremely difficult. The main reason for this is that controlling all factors except the one under study, while easy enough in medical research,²² is difficult in market research because of the existence of innumerable variables between test and control situations which may alter results in one but not in the other, hence vitiating conclusions. However, with all of its limitations, we can look for greater and greater use of controlled experimentation in market research because of the promise of more precise solutions to demand-analysis problems.

Conclusions

The author has attempted to present an overview picture of the methods which may be employed in determining the market for firm and industry offerings. While it is true that the consumer in the free-enterprise system may choose as he pleases, hence complicating the job of the vendor, there is little excuse for ignorance on the part of sellers concerning the markets they are serving at this stage of our knowledge of research methodology. Actually, methods of investigation are available which may provide vendors with needed market knowledge.

²² Giving a serum to every other patient, applying a medicament to burns on only one side of the face, etc.

It should be noted, however, that the various methods are not alternative schemes of investigation to be chosen as one chooses the color of a jacket to be worn on a certain day. Rather, the method should be selected as an expert chooses a golf club for a specific task to be performed. Usually only one scheme will precisely produce the results one wishes to achieve, although some studies must be based on a combination of methods because of the limitations of any one method in providing all of the information required. The trouble in golf *and* research is that one must be skilled enough to be able to choose the most effective implement to use.

One final word: Information concerning markets, no matter how complete and accurate, is no substitute for intelligent executive action. That is, the results of market investigations do not automatically provide answers to the best course to take, given all the circumstances of the problem with which the firm is faced. Moreover, decisions have to be made concerning hundreds of different questions which cannot economically be studied or which are beyond the purview of the investigator. It must be kept in mind, further, that even assuming information is available, intelligent use must be made of it. The point is, however, that market research findings should be extremely helpful tools to those who are responsible for making wise managerial decisions.

Understanding Lease Financing

J. FRED WESTON / RUPERT CRAIG

Lease financing of real estate, and even equipment, can free your company's assets for use elsewhere and turn up a tax advantage for your company at the same time.

One of the important new developments in financing in the past decade has been the emergence of lease financing as an important method by which business firms may obtain the use of assets. Leasing has a long history in connection with the rental of land and building. Now, however, it is possible to lease or rent virtually any kind of asset including equipment, trucks, autos, furniture, rugs, etc. Another aspect of recent developments has been the sale and subsequent lease-back of property.

In one sense, leasing is as old as commercial transactions. Rental contracts have long existed as a device for distributing risk and returns between owner and user. Numerous examples of leasing may be found in earlier decades. Safeway adopted the policy of leasing its stores in 1936. Sears-Roebuck was another important early user of sale and lease-back, beginning in 1946 when it sold some Wisconsin stores to the Northwestern Mutual Insurance Company.

In 1943, Gimbel sold its Philadelphia store for \$4.3 million to the Fidelity Trust Company, a taxfree institution whose beneficiaries include Cornell, Yale, and the University of Rochester. Other well-known users of lease-financing arrangements are: Fruehauf Trailer Service Stations, Greyhound Bus terminals, Crucible Steel warehouses, new plants for the Continental Can Company, and restaurants having the Howard Johnson franchises.

In addition to the leasing of real property, the leasing of equipment has developed in recent years, increasing ten-fold since 1950 and now approximating some \$250 million

annually.¹ The range of items covered by leasing potentially includes practically everything a business may use.

In view of the wide and increasing use of leasing, questions have been raised about whether it serves a basic economic function or whether it has become a fad with limited valid applicability. This paper seeks to provide a foundation for understanding leasing. It centers on specific numerical examples to make clear the sources of the financial advantages and disadvantages of leasing. It is hoped that the framework provided will make it possible to identify the circumstances under which leasing may be the appropriate method of financing the use of assets.

Characteristics of the Lease

In the immediate post World War II period, there were many special tax aspects of leases which have since been closed by Bureau of Internal Revenue regulations. Bureau rulings have somewhat stabilized the major characteristics of *bona fide* lease transactions as follows:

One, the term must be less than 30 years; otherwise it is regarded as a form of sale. *Two*, the basis for the rent should represent a reasonable average return to the lessor, on his investment (6 to 10 per cent). *Three*, the renewal option should represent a *bona fide* renewal option, and this can best be established by merely giving the lessee the first option for an equal *bona fide* outside offer. *Four*, there shall be no repurchase option or, as in the case of the renewal option, the

¹ These data do not include real estate, building, automobiles and trucks. They eliminate all forms of conditional sales agreements sometimes called leases.

lessee should simply be given parity over an equal outside offer.

Thus, in a sale and lease-back transaction, the original sale must represent an arm's length transaction between the seller and purchaser. The nature of the property should be real estate or land and/or equipment used in the business conducted by the lessee. The sale price should represent a reasonable negotiated price related to fair market value.

Cost of Leasing vs. Cost of Owning

To understand the nature of the possible advantages and disadvantages of lease financing, we must first make a comparison of the cost of leasing vs. the cost of owning equipment.

It is possible to set up a transaction in which there is no advantage from a financial standpoint to either leasing or owning. For example, for every \$1,000 borrowed for a 10-year period of time at 5 per cent interest, an annual payment of \$130 would have to be made (see Table I). Over a 10-year period of time, of course, \$130 represents \$1,300. Thus, for each \$1,000 borrowed, \$1,300 is paid back. This represents the sum of amortization of the principal, plus the 5 per cent interest on a declining balance over the 10-year period of time.

The payment of \$130 represents (for each year) payment of interest up to the amount owed on the outstanding balance for that year, and an amortization of principal amounting to the difference between \$130 and the amount of interest due for that year. The pattern is illustrated by Table I.

If the asset were owned rather than leased, depreciation could be taken as a tax-reducing expense by the owner of the asset. If depreciation were calculated on the so-called annuity method, the amount of depreciation each year would be the same as that indicated in Table I. Thus, given a certain specified kind of depreciation procedure and a certain kind of lease arrangement, the two forms of paying for the ownership of an asset would be exactly equal.

It should be noted that the form of lease arrangement that is usually employed is a "net lease." On a net lease basis the lessee, the company using the asset, pays for the costs of maintenance, taxes, insurance and other expenses directly related to the property. Here again, whether the property is leased or owned, these maintenance expenses of all kinds are paid for by the lessee, the user of the property.

We may now consider a series of factors which will influence the cost of the lease vs. owning the piece of property. In the previous example set out in Table I, if the firm had depreciated the property on a straight-line basis, depreciation in the earlier years would be higher than the amortization of the loan under the usual loan arrangements, and as is implied in a uniform rental under a lease arrangement. However, the cash outflow under the lease arrangement or under the borrowing arrangement under the assumptions we have set out would be the same in either case. By charging depreciation off on a straight-line basis, the firm will secure tax benefits on a basis which is greater in the earlier years. The use of straight-line depreciation will make the owning alternative better than the leasing arrangements under the assumptions thus far.

If the firm uses accelerated depreciation, such as the sum of the digits or the double declining balance, it will obtain even larger tax savings in the earlier years of the use of the property. Hence ownership will be even more advantageous than leasing.

Two factors of greatest importance are likely to be (a) residual values and (b) tax considerations. Each shall be discussed in turn.

Residual Values

Residual values are likely to be greater on real estate, both land and buildings, than on equipment. With inflation and rising real estate values generally, residual values on land and buildings may be so large as to offset substantial other possible benefits of leases.

TABLE I
AMORTIZATION OF A LOAN

10-Year Loan at 5% Interest. Constant Annual Payment \$130

Formula $\left[\frac{\text{Present Worth of 10 Annual Rents}}{\text{equals } \$130 \text{ times}} \right] \left[\frac{\text{Interest Factor at 5\% for 10 years}}{\text{10 years}} \right]$

$$1,000 = 130 \text{ times } 7.7217$$

Also can be expressed:

$$1,000 = \frac{130}{(1.05)} + \frac{130}{(1.05)^2} + \frac{130}{(1.05)^3} + \dots + \frac{130}{(1.05)^{10}}$$

- 1 - Year	- 2 - Cash Flow	- 3 - Interest	- 4 - Repayment	- 5 - Balance	- 6 - Depreciation	- 7 - Tax Expense	- 8 - Tax Saving	- 9 - Net Cost of Owning	- 10 - Present Value Factor	- 11 - (9) X (10) Present Value of Cost of Owning	- 12 - Lease Cost After Tax	- 13 - (12) X (10) Present Value of Cost of Leasing
1.....	130	50	80	920	100	150	75	55	.95	52.25	65	61.75
2.....	130	46	84	836	100	146	73	57	.91	51.87	65	59.15
3.....	130	42	88	746	100	142	71	59	.86	50.74	65	55.90
4.....	130	37	93	653	100	137	68	62	.82	50.84	65	53.30
5.....	130	33	97	556	100	133	66	64	.78	49.92	65	50.70
6.....	130	28	102	454	100	128	64	66	.75	49.50	65	48.75
7.....	130	23	107	347	100	123	62	68	.71	48.28	65	46.15
8.....	130	17	113	234	100	117	58	72	.68	48.96	65	44.20
9.....	130	12	118	116	100	112	56	74	.64	47.36	65	41.60
10.....	130	6	124	zero; final payment \$124	100	106	53	77	.61	46.97	65	39.65
									TOTAL	496.69		501.15

TABLE II
ILLUSTRATION OF TAX ADVANTAGE OF SALE
AND LEASEBACK

<i>Depreciated (tax) Basis:</i>	
Land	\$4,000,000
Building	4,000,000
	<u>\$8,000,000</u>
<i>Fair Market Value (Selling Price)</i>	
Land	\$10,000,000
Building	10,000,000
	<u>\$20,000,000</u>
Net Income Before Tax @ 20%	\$4,000,000
Tax @ 50%	<u>2,000,000</u>
Net Income After Tax	\$2,000,000
Sell at Fair Market Value	\$20,000,000
Tax Basis	<u>8,000,000</u>
Capital Gain	\$12,000,000
Capital Gain Tax @ 25%	3,000,000
Sales Price Less Capital Gains Tax	<u>\$17,000,000</u>
Income From Property	\$4,000,000
Rental (\$80 per \$1,000)	<u>1,600,000</u>
Income Before Taxes	\$2,400,000
Tax @ 50%	<u>1,200,000</u>
Income After Tax	1,200,000
Return on \$17,000,000 @ 20%	\$3,400,000
Tax @ 50%	<u>1,700,000</u>
Income After Tax	\$1,700,000
<i>Total Income: (after tax)</i>	
On Rented Property	\$1,200,000
On Funds From Sale	<u>1,700,000</u>
	\$2,900,000
Income After Tax Before Sale and Leaseback	<u>\$2,000,000</u>
Gain in Income After Tax	\$ 900,000

On the other hand, equipment is subject to a greater rate of obsolescence. Residual values in the ownership of equipment are not likely to run to large levels. As a broad generalization, therefore, it is valid to state to business managers: buy land and building; rent equipment.

Tax Advantages of Sale and Leaseback

The overwhelming advantage of leasing may derive from tax considerations. This can best be illustrated by means of a specific example. Such an example is set out in Table II. Table II represents one of the types of tax advantages of leases. In this illustration the firm is assumed to own land worth \$4,000,000 and a building which has been depreciated to \$4,000,000. Its tax basis is therefore \$4,000,000. The land and the building have a fair market value of \$10,000,000 each. The firm earns a 20 per cent rate on the property before tax, amounting to \$4,000,000. If the tax is 50 per cent, the firm has a net income after tax of \$2,000,000.

The firm is now assumed to sell the land and building at the fair market value of \$20,000,000. Since the land and building had a tax basis of \$8,000,000, a capital gains tax of \$3,000,000 is involved. When the firm pays this tax, it has cash remaining of \$17,000,000.

The rental that the firm would pay for the use of this property on an \$80 per \$1,000 basis (reflects actual practices) would be \$1,600,000. Assuming that the firm has the same income of \$4,000,000 a year from the use of the property, after deducting the rental of \$1,600,000 the firm would have an income of \$2,400,000 per year. At a tax rate of 50 per cent, this would represent \$1,200,000 income to the firm after taxes.

The firm has additionally \$17,000,000 net after paying the capital gains tax on the sale of the land and building. If the firm earns 20 per cent on this money, as it earned on the land and building, this would represent \$3,450,000. That amount is taxed at 50 per cent, amounting to \$1,700,000. The income after tax would be the same, \$1,700,000. When to this amount is added the net income remaining from the use of the original property under lease, the firm now has income after taxes of \$2,900,000. This income amounts to \$900,000 per annum more than the firm earned when it owned the land and

building and the tax basis for depreciation purposes of the building was \$4,000,000.

There are clearly two advantages involved here. (1) When the building has been fully depreciated, it is worth more to some other purchaser than it is to this firm because the new purchaser can use the building and benefit from his ability to depreciate the value of the building for tax purposes. (2) In addition, it will be noted that while the land in the ownership of the user of the building could not be depreciated for tax purposes, the user of the land is receiving a tax benefit in that the rental is fully deductible for tax purposes, as an expense. Since the rental includes the amortization of the land, the land, in effect, is depreciated by the user of the property in the annual rental payments that he makes.

The firm has an unrealized capital gain which can be sold, yielding additional funds to the firm which can then be put to use to earn additional income.

It is situations of the kind described in Table II that make leasing arrangements attractive. These kinds of opportunities exist in large number and have given rise to the widespread use of leasing and sale and lease-back.

Tax Advantages to the Lessor

Strong tax inducements also exist for the investor. These have been increased with the opportunity afforded of taking accelerated depreciation method. The investor is in the 70 per cent tax bracket, the lease is on a 5 per cent return basis. The property has a market value of \$1,000 originally. In any subsequent year its market value is assumed to be the original cost less depreciation on a straight-line basis on a 10-year life. The sum of the digits method of depreciation is used by the investor for tax purposes.

The calculations of the position of the investor are taken at the end of the first year and at the end of the second year on a tax account basis (See Table III.)

On a tax account basis, the investor has a cash income of \$130 each year. The interest

expense is \$50 each year since we assume that he has borrowed the \$1,000 with which he holds the property. The depreciation the first year, using the sum of the digits method, is 10/55 of \$1,000. This amounts to \$182. We continue with the analysis for the first year: \$50 interest expense plus \$182 depreciation equals \$232. Income is \$130, so a tax loss of \$102 is incurred. This represents a tax saving of 70 per cent, or \$71, for the first year.

The cash account for the first year is as follows: Cash income is \$130, the tax saving is \$71, yielding a total of \$201. Interest expense of \$50 results in a net amount of \$151 of net cash flow.

For the second year the interest expense is \$50, depreciation is \$164, representing 9/55 of \$1,000. Total expenses are \$214 less income of \$130, giving a tax loss of \$84, and a tax saving of \$59.

In the cash account for the second year, cash is \$130, and tax saving is \$59, giving a total of \$189. The interest expense is \$50, giving a net result of \$139 as a gain in cash for the year. (See Table III.)

At the end of the second year the property is sold. The selling price is at the depreciated value on a straight-line basis of \$800. The tax basis of the property is \$1,000 less depreciation of \$182 plus \$164, which equals \$346 deducted from \$1,000, or \$654. The capital gain is \$146. The tax of 25 per cent on the \$146 is \$36, giving a gain after tax of \$110.

The cost of the property was \$1,000. If selling price less tax was \$764, the decline in the cash value of the property, therefore, is \$236. The gain in cash on the cash flow account for the two years was \$290. The decline in cash on the property transaction was \$236, giving a net gain after tax of \$54. This \$54 represents the gain per \$1,000 of investment. On a \$1,000,000 investment, for example, it would represent a gain of \$54,000.

On this transaction, the investor has not necessarily used any of his own money. He may have borrowed the entire amount, based on his credit strength. As a consequence, the

TABLE III
LEASING FROM STANDPOINT OF INVESTOR

Assumptions

1. Investor in 70% bracket.
2. Lease on a 5% return basis.
3. Property's market value is original cost less straight line depreciation basis on 10-year life.
4. Sum of digits method of depreciation is used by investor for tax purposes.

Calculations of Position of Investor (approximations used for simplicity)

	First Year	Second Year	Sale of Property at End of Second Year	
	Tax Account			
Income.....	\$130	\$130	<i>Selling price</i>	\$800 \$900
Expenses:			<i>Tax basis</i>	654 654
Interest.....	50	50	<i>Capital gain</i>	146 146
Depreciation.....	182	164	<i>Tax</i>	36 62
Total expenses.....	232	214	<i>Gain after tax</i>	110 184
Income.....	130	130		
Tax loss.....	102	84		
Tax saving at 70%.....	71	59		
	Cash Account			
Income.....	130	130	<i>Cost of property</i>	\$1000 \$1000
Tax saving.....	71	59	<i>Selling price less tax</i>	764 838
	201	189	<i>Decline in cash</i>	236 162
Expense—Interest.....	50	50		
	151	139		
Sale at \$800			Sale at \$900	
Gain in cash 1st year.....	151		Gain in cash.....	\$290
Gain in cash 2nd year.....	139		Decline in cash.....	162
	290		Net gain after tax.....	128
Decline in cash.....	236		(per \$1000 investment)*	
Net gain after tax.....	54 (per \$1000 investment)*		Gain per year.....	64 or 6.4%
Gain per year.....	27 or 2.7%		Before tax equivalent $6.4\% \div .3 = 21.3\%$	
Before tax equivalent.....	$2.7\% \div .3 = 9.0\%$			

* The investor uses his borrowing power; the use of his own funds may be negligible.

\$54,000 return per \$1,000,000 property involved does not represent the return to the investor on the basis of the actual amount of money which he has had tied up in the transaction. Because of the tax savings through use of accelerated depreciation technique, his gain as a per cent of the amount of money actually tied up in the transaction may be 50 to 70 per cent.

It has been shown thus far that the major advantage that is likely to accrue for an ownership method of using property is the residual value that is likely to exist at the end of the life of the property. On the other hand, tax advantages exist both for the lessor-investor, and for the user of the property. These tax advantages may be so substantial as to offset the possible residual values under the ownership arrangement. However, it is not possible to generalize on this matter, and each situation must be analyzed individually on its own merits.

Advantages of Leasing to Vendor-Lessee

Some of the other possible advantages of lease financing should be considered. Following are advantages from the standpoint of the vendor-lessee.

1. Rental expenses are deductible, and may include amortization of land and the value of buildings already substantially written off.

2. It may increase the firm's ability to acquire funds.

3. It may be cheaper.

4. Restrictions on loan agreements may be avoided.

5. The purchaser of the lease does not own a general obligation of the vendor-lessee. If the lease is disaffirmed, prevailing practice seems to be that the valid claim on the company is one year's rental if the company goes into bankruptcy, and three years' rental if the company goes into reorganization. Each of these possible advantages is now briefly discussed.

- The rental expense is deductible, and may include amortization of land and the value of buildings already substantially written off. Table II illustrated how this might take place. In effect, the firm can sell the property at its true value and have this cash for investment in other uses. In the meantime, it may obtain greater tax deductions from the income which it earns on the use of the property.

- The use of lease financing may increase the ability of the firm to acquire funds. If the firm owns a piece of property and were to borrow on it, it probably could not obtain more than 60 to 70 per cent of the value of the property. However, in a lease arrangement it may acquire virtually 100 per cent of the value of the property.

This argument is valid so far as it goes. However, it must be recognized that a firm which is able to borrow on an unsecured basis may be able to obtain funds far in excess of the value of property which it may own.

- Lease financing may be cheaper. This depends upon the period over which property covered by the lease is amortized, and also depends upon the rate of interest used in the lease arrangement compared with the rate of interest at which the firm might otherwise be able to borrow. Also, the cost of obsolescence is an additional expense if the property is owned. The residual value of the property, if owned, must be taken into account in the analysis of cost.

- Restrictions of loan agreements may be avoided by the use of leasing. This appears to be true for the time being, but with the increased recognition that leases represent a form of debt obligation, lessors and investors may insist upon more restrictions unless the tax advantages are so great that restrictions of this kind are not necessary.

- The purchaser does not hold a general obligation of the lessee. This may reduce the claims on the company in reorganization or bankruptcy. However, it reduces the strength of the position of the investor, the vendee-lessor.

Disadvantage to Lessee

There are also possible disadvantages to lease financing. The most important of these disadvantages is that the residual values of land and building revert to the owner of them. This may represent a significant loss during an inflationary period, or it may represent a loss if the property is one in which property values are growing greatly because of the particular kind of development of a city. In 1952, for example, the authors were consultants on a problem in which a firm was contemplating lease financing. The firm owned property near an airport. The property was rising in value at an average rate of about 20 per cent per year. Leasing under these circumstances was clearly undesirable.

The second possible disadvantage of the lease is that the rental payment is a fixed obligation. It is a fixed obligation just as interest on debt is a fixed obligation. Failure to recognize this may result in over-extension of commitments by a firm and result in reorganization or bankruptcy just as surely as the inability to meet interest payments.

There may be less flexibility and adjustability to changing market conditions. If a firm owns its property, it may sell a piece of it. It may make additions to it, or make adjustment to it which it might not be able to do under a lease arrangement.

Finally, a lease may actually cost more for some of the reasons indicated above.

Advantages to Lessor

We may now turn to an appraisal of leases from the standpoint of the investor, or vendee-lessor.

The investor may benefit from the ability to take accelerated depreciation which reduces ordinary income at high tax rates in the early years. After two or three years the investor may sell the property and take a capital gain on the difference between the tax basis of the property and its true market value, representing the amount by which the depreciation was actually accelerated. This gain, however, is taxed at the long-term capital gains rate rather than at the ordinary

income rate. The differential rate of taxation on ordinary income vs. capital gains may result in a substantial gain to the investor.

A second major possible advantage from the standpoint of the investor is that he may benefit from any rise in the values of the property. He is the residual owner, and at the expiration of the lease, although he has fully amortized the property, the property still has value. If subsequent options are on an equal outside offer basis, or if a subsequent sale is at fair market value, the investor may benefit substantially.

A third possible advantage to the investor is that he may place a higher interest rate basis into the lease rental charge than he would be able to obtain on a straight loan. Since the lease charge represents a combination of the amortization of the loan as well as interest, the interest charged may be to some extent hidden, and thus the charge may be higher than otherwise.

Disadvantages to Lessor

There are also some possible disadvantages to the investor.

One of the problems involved in lease financing is the time consumed in tailoring the lease agreement to the specific needs of vendor-lessee. This is one of the reasons why leasing companies have grown up. They become expert in arranging lease contracts and act as an intermediary between the user of the property and the owner.

The second possible disadvantage to the investor is that if there is a general economic decline or if the business of the lessee fails, the lessor bears considerable risk of loss. However, in a vigorously growing economy such as we have experienced during most of the post World War II period, and with rising price levels, these risks seem to have been relatively small. In addition, credit ratings of lessees may be screened to obtain the strongest firms.

Appraisal of Leasing

How then shall we appraise leasing as a form of financing for the individual business

firm? There certainly is no magic in the lease arrangement. Where the investor or lessee, or both, are able to gain substantial tax advantages, a leasing arrangement may be advantageous to both parties. If one party has a substantial tax advantage and the other not, the leasing arrangement may take place at such a rate that the other party is enabled to benefit at least in part from the tax advantage gained by one of the parties.

Without tax advantages, the difference between owning and leasing may be determined by a very close set of considerations.

In the first place it should be clearly recognized that a leasing contract has some characteristics of a straight debt arrangement and uses up some of the firm's debt-carrying ability. In the second place, the rental is a fixed obligation, and many have urged with considerable validity that in a leasing arrangement the capitalized value of the property should be shown as an asset, and the capitalized value of the lease obligation should be shown as a liability.

In the absence of major tax advantages, the question of whether leasing is advantageous or not primarily depends on the firm's ability to acquire funds without leasing. A large, strong firm with access to the capital markets is not likely to find leasing

advantageous unless important tax advantages are involved.

Certain generalizations may therefore be made. Because of the importance of residual value, it is likely, by and large, to be advantageous to a firm to own land and buildings. On the other hand, because of the obsolescence factor, it may be more advantageous for a firm to rent its equipment.

However, where equipment is standard and has a long life and the danger of obsolescence is small, it may be advantageous to own the equipment because of residual values. Also, such equipment can be substantially replaced through repairs and maintenance over a 3 to 4 year period of time, and such expenses can be fully deductible as current expenses for tax purposes. By this method a firm obtains more rapid acceleration of depreciation deductions for tax purposes than it could obtain either under renting or by using one of the accelerated depreciation methods.

Leasing is a welcome addition to the methods of financing firms in a growing economy. It is technical and intricate. Leases cannot be used without the aid of an expert who understands the possible advantages and pitfalls of a highly complicated form of financial arrangement.

The complexities of business are such that someone who understands history, literature and philosophy, who is in a position to do some disciplined thinking, has the type of mind that will ultimately succeed.

William C. Caples

The Effects of Inflation on Life Insurance

DAVID B. HOUSTON

How inflation has affected the life insurance industry as a savings institution and why the industry still continues to prosper.

One of the leading concerns of American economists in the post World War II period has been the problem of inflation. The marked rise in the price level from 1946 to 1958 has lead economists to speculate on the possible beneficial or adverse effects of such price movements.

These discussions of inflation usually include a consideration of its impact on the institution of life insurance. Why? Because life insurance (1) represents an important method of saving for many people; (2) is a fixed dollar investment, i.e., in all types of policies except term insurance the insured pays a stipulated premium and is guaranteed certain specified cash values in future years; and (3) in many cases is a long-term investment.

In other words, the investment in life insurance provides the insured with no hedge against inflation. In fact, it is possible that the percentage increases in prices may exceed the interest rate being earned through the life-insurance policy, in which case the insured is actually earning a negative rate of interest in terms of real purchasing power. Such was the case from 1946 to 1958 when the Consumer Price Index increased at an annual rate in excess of 2½ per cent, the rate of interest guaranteed in most life-insurance policies.¹

The purpose of this paper is not to debate the pros and cons of inflation but rather to examine some of the available data in an effort to determine what, if any, empirical relationships exist between changes in the

price level and the pattern of savings through life insurance.

Three questions will be considered: (1) What is the long-term relationship between the price level and savings through insurance? (2) What relationship has held in the period 1946 to 1958? and (3) What is the effect of inflation on the life insurance industry?

Does Price Level Affect Savings?

Figure I shows the relationship between savings through insurance and the cost of living from 1919 to 1958 where savings is defined as the net increase in life-insurance company reserves in any given year. Dividing this figure by the premium income for that year indicates the proportion of premiums devoted to saving, and this proportion is plotted on the vertical axis.

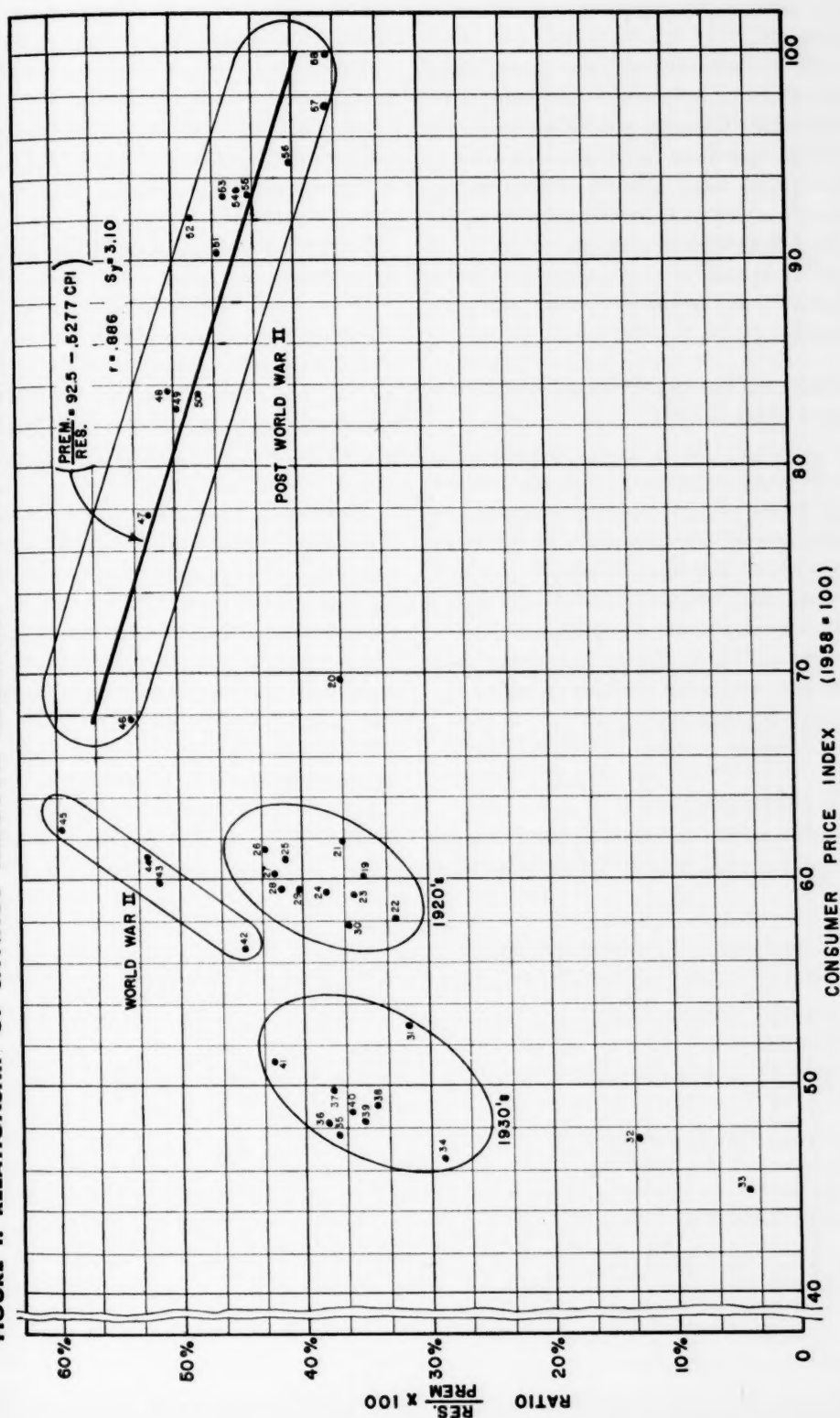
The cost of living, defined by the Consumer Price Index as published by the Bureau of Labor Statistics (1958 = 100), is plotted on the horizontal axis. An examination of this chart shows that there is no simple long-term relationship between savings through insurance and the price level.

In the 1920's we had fairly stable prices and a relatively constant ratio of savings to premiums. In the 1930's, prices were stabilized at a lower level, but savings through life insurance was relatively unaffected, except in 1932 and 1933, the two most severe years of the depression.

During World War II the proportion of premiums devoted to savings increased sharply, probably as a result of restrictions on personal consumption. The post-war era

¹ From 1946 to 1958 the Consumer Price Index increased at an average annual rate of 3.3 per cent.

FIGURE 1: RELATIONSHIP OF SAVINGS THROUGH INSURANCE TO COST OF LIVING INDEX, 1919 TO 1958



was one of increasing prices and decreasing savings.

On the basis of these data, generalization over the long term seems dangerous if not impossible. Tentative predictions of savings through insurance could be made only for the extreme cases of severe depression and major world war. In serious depression, savings fall almost to zero, as would be expected. In time of war, savings rise sharply because many avenues of consumption are closed.

Prices and Savings Through Insurance from 1946 to 1958

Since World War II there has been an inverse relationship between prices and savings through insurance, i.e., as the price level has increased the proportion of premiums devoted to saving has decreased.

This relationship is evident from Figure I where a least-squares regression equation has been fitted to this portion of the data. The following is the resulting equation:

$$\frac{\text{Change in Reserve} \times 100}{\text{Premiums}} = 92.5 - (.5277) \text{ Consumer Price Index}$$

This equation can be interpreted to mean that a one unit *increase* in the Consumer

Price Index (1958 = 100) has been accompanied by a one-half unit *decrease* in the ratio of reserves to premiums. The negative correlation between these two variables is quite high ($r = -.886$), and nearly 80 per cent of the variation in the ratio of reserves to premiums is associated with changes in the Consumer Price Index.

A second set of data useful in indicating changes in the pattern of savings through life insurance in the post war period is the percentage of ordinary life insurance in force by type of policy, as shown in Table I.

From 1950 on, "heavy savings" contracts declined in importance from nearly one-half of all ordinary insurance in force to approximately one-third.

"Moderate savings" policies were relatively unchanged while contracts with "no savings" element nearly doubled as a percentage of ordinary life insurance in force. It is important to note that the figures in Table I relate to the ordinary branch of the business only, and, therefore, do not include data for group life insurance which is almost exclusively term insurance. If group insurance were included, the increase in the "no savings" category would be even greater.

Both of the above sets of data indicate the same conclusion: since World War II there

TABLE I
PERCENTAGE DISTRIBUTION OF ORDINARY LIFE INSURANCE IN FORCE BY TYPE OF POLICY

Type of Policy	1950	1954	1957
Retirement Income.....	5.8%	5.3%	4.1%
Endowment.....	15.0	13.0	9.7
Limited Payment.....	25.3	22.5	20.4
Sub-Total "Heavy Savings".....	46.1	40.8	34.2
Ordinary Life.....	37.0	35.4	36.7
Permanent Combination Forms.....	5.9	7.8	8.8
Sub-Total "Moderate Savings".....	42.9	43.2	45.5
Term.....	5.8	6.4	6.5
Decreasing Term.....	....	1.5	2.8
Temporary Combination Forms.....	5.2	8.1	11.0
Sub-Total "No Savings".....	11.0	16.0	20.3

Source: Institute of Life Insurance, "The Tally of Life Insurance Statistics," January 1959, p. 2.

has been a steady decrease in the relative importance of savings through life insurance. At least three factors may account for this change. First, the proportion of premiums devoted to savings was abnormally high (60 per cent) at the end of 1945. Perhaps the movement downward is simply an adjustment to a more normal relationship. As can be seen from Figure I, the present proportion of 37 per cent is still slightly above the average for the 1920's and 1930's.

Since 1945, group life insurance has grown very rapidly—from 22 billion in force to 145 billion in force at the end of 1958. Since 99 per cent of this type of insurance is term, the proportion of premiums devoted to reserves is negligible. Thus, the increasing importance of group life insurance would tend to depress the change in reserve to premium ratio over this period.

The third factor important in accounting for the change is inflation. It seems reasonable to assume that potential purchasers of life insurance have recognized its limitations as an investment in periods of rising prices and have acted accordingly. Namely, they have followed one of the various "buy term and save the difference" arguments. Thus, they have not bought such "heavy savings" contracts as retirement income or endowment but rather have purchased term insurance and invested the difference in premiums in other savings media.

Since the relative level of savings through insurance has now reached its pre-World War II position, we might reasonably expect it to stabilize in the range of 33 per cent to 43 per cent of premiums. However, if inflation is the critical factor, then continued rises in the price level will further depress the savings to premium ratio. In the long run this could seriously reduce the importance of the life insurance business as a savings institution.

Performance of the Life Insurance Industry

One important measure which can be used to evaluate the performance of the life insur-

ance business in terms of the economy is the ratio of premium income to disposable personal income. This ratio indicates the life insurance industry's share of the available "pie". Premiums were equal in 1945 to approximately 3¼ per cent of disposable personal income, and by 1958 they had increased to 4 per cent.

Thus, the post-war inflation has not inhibited the growth of the insurance business in relation to the national economy. Furthermore, the above percentages do not reflect premium income from the accident and health insurance business accruing to life companies, which has grown very rapidly since the war.

A second method of measuring the growth of life insurance is to examine the rate of increase in total assets. For the industry as a whole the rate of growth of company assets over the last 68 years has been relatively constant and has not been greatly influenced by changes in the price level.

From 1890 to 1958 the average annual rate of growth in total assets was 7.5 per cent which is only slightly higher than the rate of 7.0 per cent prevailing in the post World War II period. Thus, it does not appear that the recent inflation has impaired the asset growth of the life insurance companies.

Conclusions

It can be concluded that:

- There is no simple long-term relationship between the cost of living and the extent of savings through life insurance.
- In the post World War II period there has been a steady decrease in emphasis on savings through life insurance, which is partly a result of an adjustment from the abnormally high level of savings prevailing at the end of the war, and partly due to a shift in the preference of insurance buyers to equity investments.
- Up to the present there is no indication that the life insurance industry has suffered as a result of the post-war inflation.

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2.8
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20.3

A System for Measuring Office Work Performance

KENNETH W. OLM

If you have been looking for some way of evaluating the performance of workers in your office, here is a system that has been tested and proved.

The scope of most modern enterprise is growing to such magnitude that continuous evaluation of work performance is considered necessary to achieve an expected level of efficiency.

The process of evaluation is the essence of the control function, which is often defined as the measurement and correction of activities of subordinates to make sure that plans are transformed into action.

The control process involves three essential steps: (1) the establishment of standards; (2) the appraisal of performance against standards; and (3) the correction of deviations.¹

It is the establishment of standards upon which management may base its appraisal of performance that is the basic problem dealt with in this study.

The case study reported here deals with the development and implementation of a work measurement system which will provide for the establishment and proper use of valid standards of work performance in a large-scale procurement activity in the Air Force.

The work subjected to measurement in this study may be divided into four general categories: routine clerical, non-routine clerical, general administrative, and staff surveillance functions.

Most of this work is believed to be representative of a large and rapidly grow-

ing number of occupations in modern business enterprise and in government service.

Certain characteristics of the various jobs placed under study made it necessary to develop a highly specialized work measurement system. These characteristics included such factors as: (1) the relatively long work cycle, varying from less than one hour in some cases to more than four weeks in others; (2) the fact that much of the work involved a considerable degree of freedom in regard to methods utilized and a wide variation in the level of judgment required; (3) the limited number of jobs adequately covered by written standard practices and/or described in detail with procedure flow charts; (4) the fluctuating work loads which were subject to very little control; and, among other factors; (5) the necessity to adhere to certain personnel management practices to insure maximum acceptance and cooperation by employees at all levels.

Work Sampling

Such considerations as those mentioned above led to the decision to utilize the relatively new technique of work sampling, with suitable modifications to conform to local conditions and unusual working patterns, in the development of this work measurement system.

Work measurement systems have become recognized as fundamental in the management of most direct work today. The same cannot be said for most staff or administra-

¹ Harold Koontz, "A Preliminary Statement of Principles of Planning and Control," *The Journal of the Academy of Management*, August, 1957, p. 35.

tive activities. This area has been largely overlooked in the past, and only recently has attention begun to shift to measurement of office work activities.

The reasons for this apparent lack of interest in work measurement of staff activities are found in the nature of the work performed and the variable work load encountered. Versatility, rather than extreme specialization in work performed, was a usual situation.

An additional complicating factor to consider is the time consumed in making decisions, a variable element which cannot be ignored. Recent trends have indicated an increasing awareness of staff overhead as the volume and complexity of paperwork has grown and office salaries have increased.

Management in all fields has become concerned over the need for an efficient but economical system to appraise the performance of staff workers and to help control costs.

Such was the case in mid-1956 at the Directorate of Procurement and Production of the San Antonio Air Materiel Area. That organization has as its mission the procurement of specified products and services and the surveillance of purchase contracts to insure timeliness in production and control of quality and cost. This organization consists of a wide variety of functions and activities performed by about 225 civilian workers under military control in an office environment.

Group Performance Standards

Standards were desired only for the purpose of group appraisal, rather than for appraisal of individual workers. Considerably less precision in the standards would be tolerated than would be in a system that was to be used for incentive payments and individual appraisal.

An essential part of the design and development of a work measurement system is the question of whether or not to standardize fully the work methods prior to the measurement phase. It was decided to begin work

measurement first, rather than to insist on methods improvements as prior requirements. From a practical standpoint, to wait until complete standardization of work methods was achieved might have resulted in an indefinite postponement of any measurement.

After initial plans were formulated, members of higher management were presented with the details of the work sampling technique and with a broad outline of how the program was to proceed. Management then presented to the assembled employees brief statements concerning the purpose of the program, how it was to be carried out, and what information was desired of the employees and of their supervisors.

Employee cooperation was earnestly solicited, and complete assurance was given to the employees that their rights as individuals would be respected by all work measurement personnel.

Work Measurement System

Detailed explanations of the work measurement system were presented to all supervisors by work measurement personnel. Meetings were conducted with small groups of supervisors, and a specially prepared supervisor's manual was presented to them.

This manual contained a detailed explanation of the work measurement program along with sample forms and other pertinent data.

The decision to develop performance standards which would serve as a measure of group effectiveness, rather than individual effectiveness, made it necessary to divide the organization into work centers in which similar work was performed. Each work center consisted of a centralized area under the direct control of one supervisor. In general, work centers were also separate organization entities and consisted on the average of from six to ten persons.

Direct and Indirect Work

Since any measurement must be capable of being expressed in terms of countable units, the next step was the categorization of the

various functions of the work centers into work activities. Two distinct types of activities were recognized: "direct" work activities were those activities which resulted in an identifiable and countable work unit directly related to that activity, expressing the actual volume of work performed and reflecting the effort required to perform that work; "indirect" work activities were those activities which did not result in an identifiable and countable work activity in most instances, but were necessary for support of direct activities.

Indirect activities cannot be entirely ignored since they demand a portion of the available employee time. A fixed allowance factor determined from the work sampling was found to provide adequately for the indirect activities.

Determination of valid work activities was conducted in informal conferences between work center supervisors and work measurement personnel. The procedure followed was a relatively simple but time-consuming process.

Each supervisor was requested to answer the following questions: (1) What does your organization do, *i.e.*, what is your prime mission? (2) What work is performed to carry out that mission? (3) What end product (document, completed form, report, etc.) results from those efforts? (4) What efforts are necessary to support your prime mission activities?

After work activities were established and informal concurrence obtained, a final list with complete definitions and specified work units to be counted was prepared for official acceptance by signature.

The Partnership Concept

From the foregoing description, it can be seen that throughout the program the human relations aspect was foremost in the planning and thinking of the work measurement personnel. Strong emphasis was placed on the partnership concept between the work center supervisor on one hand and the work measurement staff on the other. This co-

operative attitude proved to be both desirable and necessary for success of the program.

As a means of determining the amount of time devoted to each of the previously determined work activities, the work sampling technique was used. Sampling theory holds that the drawing of a small number of observations at random from a larger group or universe, of which they are a part, presents a pattern of distribution similar to that of the universe.

The probable error of the estimate drawn by the sample can be calculated by using the common formula for the standard error of a sample percentage, or by use of a nomograph or published chart. Generally, it can be stated that more precision will result as the number of samples increases. As stated earlier, the goal was to stay within a maximum of plus or minus ten per cent error.

The validity of the inferences which can be drawn from the sample depends upon whether or not the sample was drawn in a random manner and upon the accuracy and applicability of the observations, as well as upon the number of observations.

Randomness is dependent upon three conditions: (1) equal opportunity for each work activity to be selected; (2) independence between activities; and (3) characteristics of each activity must remain constant during the sampling period. Since randomized times for observations are essential to reduce the extent of systematic error in a sampling process, a "Table of Random Numbers" was used to insure this condition.

"Accuracy" may be considered as a measure of the degree of bias in the sample results, where "bias" is the amount by which the long run observed mean value of a set of measurements differs from the true value of the quantity. Bias may exist either in the design or in the execution of the sampling plan. Bias in the design of the sample plan may exist in the definition of the population to be sampled, in the definition of the different states of activity, and in the method of selecting the times for observation.

Bias in the execution of the sampling plan

may exist as a result of actions of the observer and of the worker being observed. The worker can, either intentionally or unintentionally, alter the state of activity observed, thus introducing bias into the study. Observer latitude may introduce bias if efforts are not taken to avoid ambiguity in the definition of the various states of activity and if the observers are poorly trained in observation techniques.

Considerable care was exercised throughout the study to gain worker acceptance and to train observers in proper definitions of activities to be observed. It is believed that very little bias entered into the plan because of these precautions.

"Applicability" refers to whether or not the population upon which the estimate is based is similar to the longer period to which the estimate is applied. Since a period of time was selected that would be most representative of the entire year and of several years thereafter, a specific test of applicability was not considered to be necessary.

The Observation Procedure

The actual observation procedure adopted was developed after consideration of the following factors. Approximately 225 employees, divided into twenty-seven work centers, were working in a space of about 12,000 square feet. Some work centers were small closed offices; others were large, group work areas. The number of employees in a work center varied from four to ten, and they worked on an average of fourteen prime mission activities.

The entire work area was subdivided into three areas, with each of the three analysts assigned primary responsibility for one of these areas in order to enable him to develop complete familiarity with all the work activities and the workers performing them.

Several different routes of visitation were developed for each designated area in order to permit random variation of routes. From fifteen to thirty minutes were required to cover the routes completely.

The work day was divided into sixteen

half-hour periods, with two periods eliminated because they contained the two ten-minute break periods. Since the table of random numbers being used contained one hundred numbers, each of the fourteen periods of the day was assigned a group of random numbers and arrayed as follows in Table I:

TABLE I

Period Number	Clock Time	Random Numbers
1.....	0730-0759	00-06
2.....	0800-0829	07-13
3.....	0830-0859	14-20
4.....	0900-0929	21-27
5.....	1000-1029	28-34
6.....	1030-1059	35-41
7.....	1100-1129	42-48
8.....	1215-1244	49-55
9.....	1245-1314	56-62
10.....	1315-1344	63-69
11.....	1345-1414	70-76
12.....	1445-1514	77-83
13.....	1515-1544	84-90
14.....	1445-1614	91-97
		98-99 (disregard)

Using this table and a table of random numbers, observation schedules were set up for the ninety days during which the observations were made.

It was assumed that a typical work activity would have about a 10 per cent occurrence. The number of samples required to give 95 per cent confidence with a maximum probable error of plus or minus 10 per cent of the percentage in question would be 3,600. This number of observations was then established as the tentative goal for each work center.

To achieve this goal, all work centers comprising up to eight workers were scheduled for six observation trips each day. Six was regarded as the maximum practical number of observations, considering the necessity to maintain harmonious relations with the employees being observed and considering also the limited staff available for making observations.

Work centers with from eight to fifteen workers were scheduled for four visits each day.

The form used in the sampling was specially designed for the task and was overprinted for each work center. Vertical columns were provided for work activities and horizontal lines used for listing each worker in the work center. A pre-printed time schedule was added for convenience.

The analyst made his scheduled rounds at the predetermined time and noted the activity each employee was engaged in at the precise time of observation. Whatever was noted was then checked in the appropriate category as listed on his forms.

Because of the nature of the work being performed, the analyst often found it necessary to inquire of the worker what was being worked on at the time of observation. Most of the workers appeared willing to cooperate, and some expressed great interest in the program. In the event a worker was not working when observed, a mark was placed in the non-productive column.

In addition to determining what activity the workers were engaged in, a performance level of the employees was observed for the purpose of adjusting productive (working) time to reflect normal or typical performance, rather than merely actual performance.

Production Counting System

A production counting system was initiated at the same time the work sampling phase commenced. This system was developed along with work activity determination. Such factors as accuracy, timeliness, and minimum cost of maintenance were considered in setting up the production count procedure.

As a follow-through to the idea of a joint venture between supervisory and work measurement personnel, it was decided to let each work center do its own counting, using a form designed for this purpose. A necessary amount of validity in the keeping of employee records appeared to be a reasonable assumption if the employees were properly sold on the merits of the program

and were made to realize that work measurement would not be used as an adverse weapon against them.

Work activities were listed across the top of the Production Count Sheet, with the days of the week indicated in the margin. The forms to be used were overprinted with the work activities to be counted in each work center, and distribution was made to work centers.

In some cases, work units were counted on an individual basis and recapped into a weekly summary by the work center supervisor. In other work centers, as a matter of economy, automatic or central counting procedures were used where they were already in operation.

The production count sheet also contained a column for recording of actual hours on the job. This was considered necessary because of several unusual types of leave and overtime encountered that would make central payroll figures appear unrealistic for standards-setting purposes. Actual hours were recorded in this manner during the sampling period, then dropped in favor of payroll figures.

Calculation of Standards

The calculation of standards was a fairly routine process after the basic procedures were developed. Basically, random observations were used in the calculation of standards in the following manner: assuming that of 2,700 observations over a period of several months, a particular work center was observed processing a particular type of contractual document 675 times. This work center was therefore devoting $675/2700$ or 25 per cent of its available time in processing this type of contractual document. If this work center had worked 500 leveled hours (performance factor multiplied by net available manhours), then it can be stated that during the sampling period 25 per cent multiplied by 500 leveled hours, or 125 hours, were required for the processing of this type of contractual document. If there were 250 of these documents processed during the

period, it can be further stated that an average of .15 leveled manhours (125 hours divided by 250 documents) is the normal length of time required to complete each unit or document of this type.

For actual calculation of standards, an informal form was designed and reproduced for work measurement use.

Two activities, "away from desk," and "telephoning" were set up during the observation period as temporary categories only. An attempt was always made to determine why a person was away from his desk or for what purpose he was telephoning so that an appropriate allocation to a specified activity could be made. For those occasions when the two activities were observed but could not be directly allocated, it was preferable to accumulate those observations and then allocate them to each prime mission activity as the time standards were calculated.

No standards were set for the indirect activities. These activities were set up as a percentage allowance, as will be explained later.

As soon as standards calculations were completed for each work center, informal meetings were conducted for the purpose of presenting each supervisor with his standards. The promotion of good human relations was the major purpose of these meetings. Formal concurrence of standards by signature followed if no obvious errors or serious inconsistencies in standards were noted.

After standards were established, their use as an evaluation device depended upon a reporting procedure which compared the amount of employee time devoted to production with the amount of time required as determined from application of standard times. The Directorate's reporting system was designed to begin at the work center level with more detail in the work center report than in any other. As the work center reports were combined into divisional and Directorate Summary reports, less detail was provided for—in conformity with the "exception principle" of management.

Calculating the Operating Effectiveness

The key item in each report was the operating effectiveness percentage, a term applied to the comparison of earned hours to available hours. The term is intended to give a simple and brief picture of how well an organization has been utilizing its labor resources (available hours of manpower) in the production of work units at standard (earned hours). The calculations are made as follows:

$$\frac{\text{Earned hours}}{\text{Actual hours}} \text{ multiplied by } 100 \text{ equals operating effectiveness as a percentage.}$$

The number of available hours is determined by deducting all clock hours in which employees were not available for work from the total number of clock hours for which they were paid during that pay period.

The number of earned hours is determined by multiplying the units of work during the period by the unit standard times. All basic productive activities were labeled "prime mission" or "direct" activities, and for each a standard time had been developed.

For indirect activities, an allowance factor was set after noting for several months the normal way that indirect or support activities fluctuated. It was determined that clerical/stenographic support tended to vary more or less directly with the volume of direct work performed. Therefore, the clerical/stenographic occurrence percentage was converted to a percentage of direct, or prime mission, activities as follows: assume clerical/stenographic occurrence percentage was 12 per cent, prime mission activities totaled 68 per cent, then clerical/stenographic allowance equals 17.6 per cent (12 per cent divided by 68 per cent). This allowance was then applied against the total of direct earned hours to give clerical/stenographic earned hours.

For the elements of administration, supervision, miscellaneous, and special projects, it was found that the proportion of total employee working time devoted to these ac-

tivities was a satisfactory allowance. The percentage of occurrence was therefore used as the allowance for these activities, and was applied against net available working hours to calculate indirect earned hours.

Certain positions in the Directorate were found to be extremely difficult to measure effectively and economically. Since it was desirable to include all personnel in the reporting system, these personnel were "factored" into the system at either 100 per cent or at a percentage factor based upon observed occurrence of productive time.

All earned hours were then totaled to give "Total Earned Hours." Total earned hours were then divided by net available hours to give an operating effectiveness percentage for the period in question. Space was also provided for noting the two previous performance percentages, as well as an average of the last three periods in order to provide a basis for discerning a trend in performance effectiveness.

Space was provided for the work center supervisor to use in commenting on reasons for low or changed effectiveness. Each supervisor was expected to read and analyze the report and to enter any appropriate comments regarding his work center; these comments were designed as a means of communication between work center supervisors and higher management.

The Reporting System

The reporting system was developed to provide management with reports at the close of each four-week period. Such a period encompassed 2 two-week pay periods. Work measurement reporting periods had to coincide with pay periods rather than with periods of a calendar month because of the necessity for using payroll data in the calculation of the reports.

A compromise had to be effected between a very short period designed to give management information quickly and a longer period which would both lessen the clerical problem of reporting and would be long enough to permit the leveling out of those

short-term fluctuations in output which could be attributed to minor and temporary cause.

The complete reporting procedure was designed to be completed within a period of eight working days following the close of each four-week period. Approximately half of this eight-day period was allocated to the supervisors for use in analyzing their reports and commenting thereon. The other four days were required for clerical preparation and for transmittal time.

Work center reports were further recapped into divisional and Directorate summaries. (See Figure I and Figure II). For the Directorate summary report, an average hourly wage rate was determined so that the report could reflect performance in terms of cost (in dollars), as well as in number of man-hours. In order to facilitate appraisal of this report, operating effectiveness percentage and the performance variances in dollars were presented as trend charts to give a better picture of the previous periods.

To enable the director to make a fuller use of these reports, he was also furnished a copy of each divisional report, with the remarks of the division chiefs, as well as a brief analysis of the current situation by work measurement personnel.

Use of this work performance as a management tool has provided the Directorate with a continuous evaluation of current operations to assist in attaining the desired level of performance. The standards and reports are being used in improving the allocation of personnel, in improving the scheduling of operations, and for obtaining greater precision in manpower planning. Using the method of least squares to show a trend, the system showed an increase in effectiveness during the first year of operation that amounted to \$76,000 of manpower, with more savings indicated as the system progressed. Management and workers alike have expressed their satisfaction with the design and implementation of the system, and with its usefulness in providing data needed to assist in making better decisions. Approval of the system was obtained from higher com-

FIGURE 1

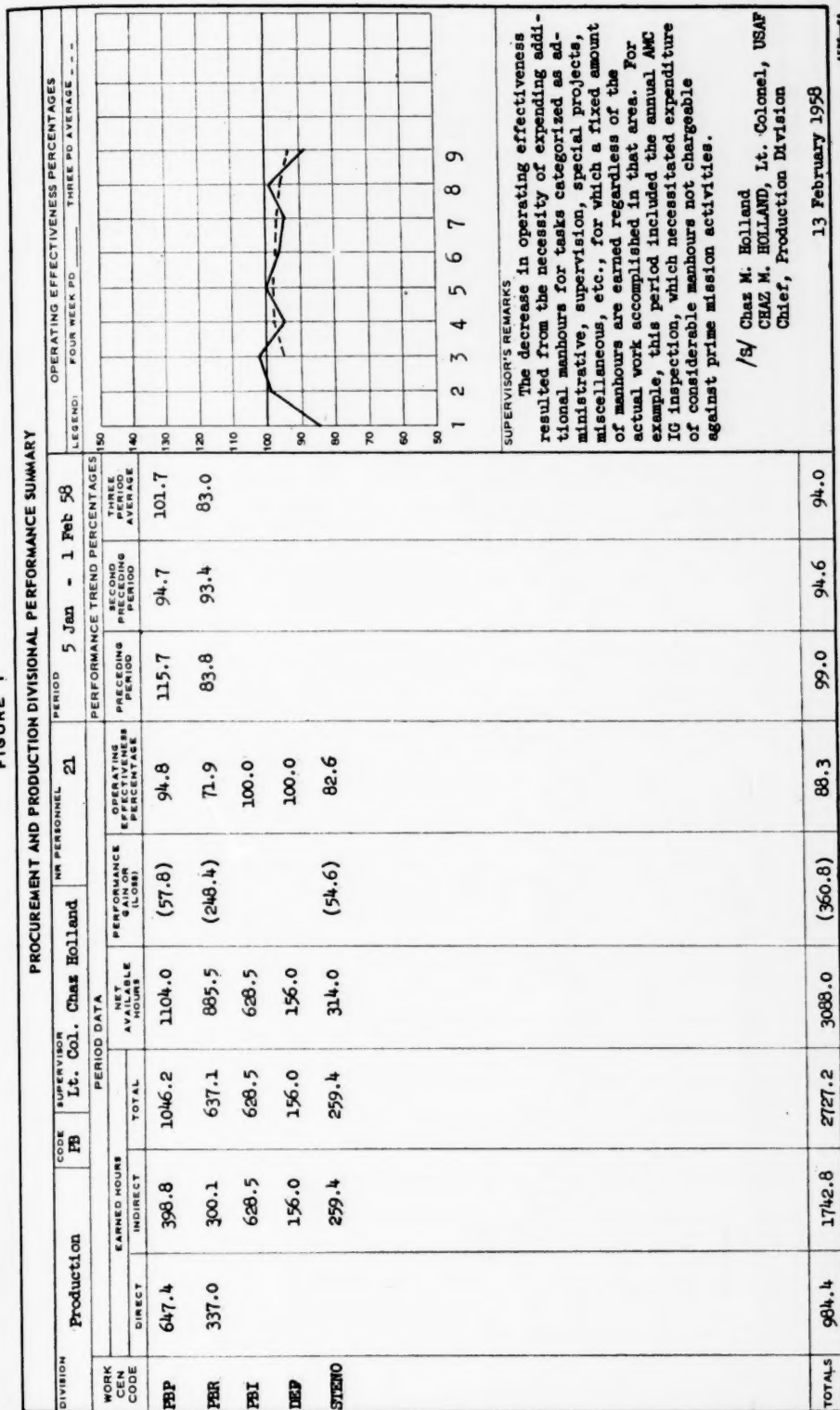
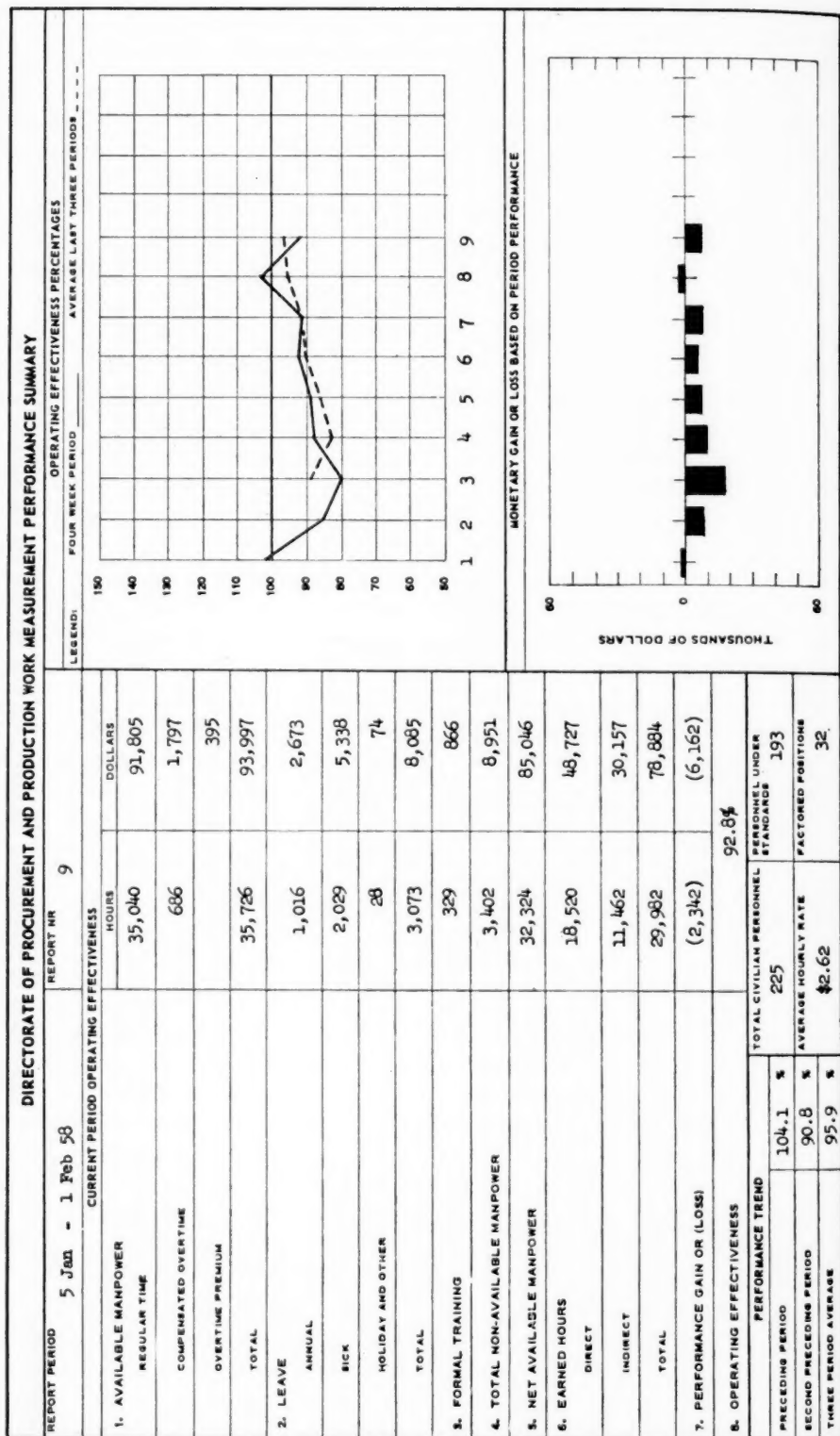


FIGURE 2



mand levels, and steps are being taken to expand this system into various field offices and into other permanent offices.

It is strongly believed this system of work measurement can be successfully applied in most other office situations, not only in purchasing and staff surveillance functions, but

in any office having a large volume of work of a nonrepetitive nature. The objective evaluation of office activities, though still relatively new, seems certain to become an increasingly important tool of the manager in his efforts to promote more effective operation of all parts of his enterprise.

A perpetual holiday is a good working definition of hell.

George Bernard Shaw

32
\$2.62
95.9 %
THREE PERIOD AVERAGE
SAAMA 809H 127E

The Causes of Management Conflict

T. E. STEPHENSON

If your management ranks are torn by internal conflict, this explanation may help you pinpoint your sources of trouble.

Discussion of industrial strife usually centers on the conflict between workers and management, or union and management. Attention is also directed to disputes between different unions and between union members and their unions, the latter often being expressed through "unofficial strikes." Strikes, go-slow campaigns and union restrictive practices are all regarded as expressions of industrial conflict and there is frequent comment upon their cost to industry and the community.

Little is said, in comparison, of the various types of conflict that exist within the management structure. One reason for this lack of comment would appear to arise from the assumption of managers themselves that they are basically rational, in contrast to the workers, who are considered nonrational.

From this assumption there has developed the notion that, because of their rationality, managers can clearly see the objectives of their organization and can plan their activities and make decisions in the light of these objectives. Furthermore, it is argued, they can see the need to cooperate with the rest of management to achieve these aims.

In much management literature, attention is concentrated on the need to obtain the cooperation of the worker, with little concern or comment about management cooperation—which is taken for granted. Thus it is assumed that management rationality, coupled with a management ideology, is sufficient to bring about the required cooperation.

This notion of the rational manager is an abstraction, just as much as the earlier one of the economic man,¹ and as such only pro-

vides a partial truth, obscuring the possibility of conflict within management. It is our purpose to indicate some areas of management conflict.

One source of conflict may arise out of the division between those who give orders and those who receive them: this, we would suggest, is a problem not only between workers and management, but also within management itself. This general source of conflict may arise out of a challenge to the legitimacy of the authority of the superiors.

Authority in industry tends to be less readily accepted now than in the past. In particular, authoritarian management has been sharply questioned, which has led to the development of persuasive management. This questioning of authority has not been confined to the workers, but has also been expressed by people in different levels of management. At the same time as this development, there has also been an increased pressure in industry towards managerial conformity.² For some this has meant the collapse of their "rebellion." For others it has heightened the conflict.

The reasons for the questioning of authority by some managers are complex, resulting from changes in the climate of ideas in the community in general and in industry in particular. The persistent claims for the advantages of political democracy have undoubtedly influenced the thinking of some. If, so they argue, there are such advantages to be found in the operation of democracy in the political field, is it not possible that similar advantages could accrue through its partial application in industry? The growing social awareness has emphasized the im-

¹ George Elton Mayo, *The Social Problems of an Industrial Civilization*, Division of Research, Graduate School of Business Administration (Harvard University, 1945).

² William H. Whyte, Jr., *The Organization Man* (New York: Doubleday and Company, Inc., 1956).

portance of the individual and his rights as well as his obligations. At the same time the search for a philosophy of management based on the uniqueness of the individual³ has stressed the value of the individual. The spread of these general and rather vague notions is imperceptibly changing people's attitudes, making them conscious of their rights and their value.

In addition, it may be—as Col. Urwick has suggested—that “Authority is, in its very nature, predisposed to unpopularity. No one likes to be ordered about. Man will only accept direction happily when it is clearly in line with his own purposes and interests as an individual and a reasonable interpretation of the law of the situation.”⁴ However, it may be open to question that no one likes to be ordered about, for it would seem that while some are predisposed to question authority for the reason suggested, there are others who appear to be very ready to accept the authority of their superiors. Indeed they are prepared to be ordered about because it relieves them of a measure of responsibility.

Moving from the notion of resistance to authority based on general grounds, such as the development of ideas and the nature of authority, we can consider some of the more specific reasons for the questioning of authority by management.

In the first place, higher levels of employment and greater opportunities for managers to move to different firms have influenced their attitudes and given them a greater independence. When they have disagreed with higher management they have not had, of necessity, to either hide their disagreement or to withdraw it once they have expressed it. They have been able to express and maintain their views in the knowledge that in the last resort they would be able to

obtain another post without too much hardship. Thus conflict is more frequently brought into the open and higher management has a clearer picture of the reaction of their subordinates to their orders and actions. This greater freedom of expression, consequent on the economic situation, brings the conflict into the open and may lead to a satisfactory resolution of the conflict—an event which would be unlikely to occur if the lower management kept their views to themselves.

Secondly, with the development of the trade union movement both on the shop floor and among white collar workers and with the increased power of many unions, the gap between the lower levels of management and the workers has often been decreased. When, in many instances, the security of the lower levels of management seems threatened, conflict is created between the lower and higher levels of management, the former taking the view that the latter have failed to protect them. In other cases, the identification with higher management is sufficiently secure for the lower management to regard the closing of the gap as the fault of the unions, whom they regard in the circumstances as too strong. Whether there is to be a conflict between the levels of management or a closing of the ranks will depend on the existing degree of identification of lower management with higher management.

Thirdly, with the increased emphasis on human relations and the growing awareness of the worker as a human being, there was sure to be some reaction among management. As managers have come to recognize the importance of the human element in the industrial situation, as they have been told of the rights of the workers, they have in turn come to reflect on their own situation and on their own rights. They tend to argue that if they have to give more consideration to the worker, then surely they are entitled to more consideration from higher management. There is the danger that higher management sees the need for a human relations approach

³ An example of this type of search may be seen in “Human Relations in Modern Business” Robert Wood Johnson. An essay from “Human Relations for Management” edited by Edward C. Bursk. (Constable and Co. Ltd., London, England, 1957) pp. 1-28.

⁴ *Management, Labour and the Community*. Edited by David Cleghorn Thomson, The Importance of Management by L. F. Urwick, M. C., M. A., pp. xii-xiii (London: Pitman, 1957).

to workers without seeing the value of the same treatment for subordinate managers. The result of this ambivalent attitude on the part of higher management is often enough to destroy the value of their human relations approach to the workers and to create conflict within management.

Besides the general and specific causes of conflict which arise over the exercise of managerial authority within the management structure, there is a group of conflicts which arise out of the organization of management.

The first area of conflict within the organization field arises between those members of the management exercising a specialist function whose loyalty leans toward their specialty, and those members exercising line functions whose loyalty tends to lean towards the organization. As an example, there may be conflict between the chemist who feels himself to be a chemist first and a member of the organization second and a production manager who is first and foremost concerned with production, which he sees as the principal aim of the organization. Evidence of this conflict between those with a loyalty to a profession and those with loyalty to the organization is often forthcoming on questions of standards both of quality and quantity. The specialist often tends to be more critical of the organization than does the line manager.

Another aspect of the particular conflict is that which arises from the feeling of the line manager that the specialist is encroaching into his territory and taking away some of his power and status. This may not be true in practice. The specialist may be severely restricted to giving advice only. However, as long as the line manager believes that he has lost power and status, he acts on the basis of his belief. In this case, he often resists the advice proffered by the specialist and seeks to isolate the specialist in the organization.

There is also the fear on the part of the line manager that decisions which he formerly made now have to be referred to specialists, and that the specialist may interfere

in his work or give advice which has not been requested. In all these instances the line manager may feel a loss of power and status. Again the loss may be illusory, but his belief may be strong. In particular he may feel that his subordinates are conscious of his changed position and may, as a result, challenge his authority. The blame for any sign of indiscipline may be laid, by him, on the specialist.

From another point of view, the specialist is sometimes regarded by line management as a threat to the efficiency of the department or the organization because the specialist is equated with the theorist.⁵ There emerges the clash between the practical man and the so-called theorist. The schemes of the specialist are regarded as suspect because, it is argued, they are too costly, their application will not lead to a profit, they are untried, they are not understood, or they have failed elsewhere. Frequently these arguments are simply rationalizations to cover the fact that the specialist is a harbinger of change and as such appears to the line manager as a threat to his security.

Change or threatened change may well bring resistance and conflict. The specialist may suggest changes in method or in organization and line management may believe that these changes may lower the status of their particular department or section by lowering the skill content of the work performed, by reducing the number of people employed in the department or by making the department subordinate in the organization structure to another, possibly new, department. The lowering of the status of the department is taken by the management concerned as reduction in their own status.

A change in method may also be regarded as a threat because of management's fear of the unknown. A manager may feel that he has understood his department, and the processes that take place in it, for a number of years. Then at the specialist's instigation, changes are made in the processes or in the

⁵ Delbert C. Miller and William H. Form, *Industrial Sociology* (New York: Harper & Bros., 1951) pp. 94-99.

administration of the department, and the manager wonders if he will be able to understand the new situation and whether he will be able to keep on top of it.

The changing situation generates anxiety which may well lead to conflict between the manager and the specialist who appears to be responsible for the change. Resistance to change is not solely the prerogative of the worker. Managers may also resist change and those who introduce it.

To summarize, the specialist may be seen as a threat because it is felt that he will encroach on the territory of line management and because he may be responsible for the introduction of change. In both cases the status, the job satisfaction, and the security of the line manager appear to be under pressure. This pressure may not actually exist, but to the manager it is real and this conditions his actions and attitudes and may lead to conflict.

Specialists are not all regarded with the same degree of suspicion. In some organizations a production engineer or other technical specialist may be acceptable, but perhaps in the same firm the personnel manager is suspect. This particular bias against the personnel manager appears quite frequently in British industry. Some technical specialists are accepted or tolerated because they are dealing with a special development which is new in the organization. They still represent a threat as bringers of change, but they may bring a knowledge and ability denied to the line managers and which cannot be acquired empirically.⁶ The line managers may accept the situation with some fear and suspicion, but they recognize that there is little or no alternative.

On the other hand, where the specialization has been based, not on a special technical advance, but on the general advantages of specialization on the intellectual plane (as may be the case with the personnel manager), there has been conflict. Personnel managers are often seen as threats to line

management's ability to handle the labor force. They are regarded as superfluous because it is argued that "anyone can handle human beings; it just takes common sense."

There are other aspects of possible conflict between specialists and line management. Trouble may arise when a line manager, once a specialist, is faced with advice from specialists in his own former field of expertise. He may feel that he knows as much as the present specialists, although indeed his knowledge may be out of date. The very fact that he has been once a specialist may make him more, rather than less, difficult.

Another problem arises when the line manager has to listen to advice from different specialists and come to a decision between them. Perhaps influenced in favor of his former specialty, he is biased in considering the various propositions and may give undue weight to the views of those in his former field. The result may be that the other specialists feel that there is favoritism; they become dissatisfied, and friction follows.

Management conflict has also to be seen from the side of the specialist. In some situations, the specialist feels frustrated by either line management and his lay superiors or both. In both cases he may offer advice and suggest schemes but finds that, on the one hand, line management is unwilling to do anything about the schemes and that, on the other, the lay superior refuses to give the schemes adequate backing because he does not understand them or because he wants to keep the peace with the line managers and not upset production. This particular type of conflict often appears to be more acute when the lay superior is an older man than the specialist, has been with the organization longer, and feels a greater sense of loyalty towards it.

However, the specialist does not find himself in conflict only with line management but also with other specialists. Each specialist tends to see the problems of the organization exclusively from his own point of

⁶ Lyndall Fownes Urwick, *Personnel Management in Relation to Factory Organization* (London: Institute of Labor Management, 1943).

⁷ Keith Davis, *Human Relations in Business* (New York: McGraw-Hill, 1957) pp. 11-12.

view, that of his specialty. The accountant sees the problems of the firm from the viewpoint of finance, the chemist sees the problems from the position of a scientist, the personnel manager regards the problems in terms of morale and the labor force, the market research people view the problems from a sales angle. The result is that whenever a sizable problem occurs, each of these specialist departments is concerned to put forward its own viewpoint, and there is frequently a juggling for position to see who can exert the greatest influence on the policy and decision makers. This can lead to conflict between the different specialist departments.

In addition, there are often attempts to build up status by the specialist departments' putting forward schemes to expand their own field. Departmental empire building goes on, and there is a struggle for the necessary permission and finance to expand. Those who succeed feel an increase of status; those who have failed often make disparaging remarks and prepare for the next round in the competition. In essence, it is a struggle for power, and it is not confined to specialist departments. The struggle may also occur between various production departments.

Another source of organizational conflict may be found between other departments. The various departments are often dependent on each other. Each wants to establish a high level of performance, but this is dependent on the cooperation of others. This cooperation may not be forthcoming. Departments may blame each other for breakdowns in their performance. Some departments may have a higher status than others. These conditions may cause irritation. There may be strong loyalty within a department or section while there is considerable conflict between different sections and departments.

Another version of this conflict can arise if shift work is in operation in an organization. The management of, say, a production shift may feel superior to another, perhaps a

maintenance shift. One shift may blame another for not making the changeover efficiently or for failure to provide some necessary information, or for some other reason which may or may not be valid.

The conflict between departments and between shifts may develop because some managers, like some workers,⁸ think in terms of "productive" and "nonproductive" work. Those departments which produce physical goods sometimes regard as "parasitical" those departments which administer, control, and provide services. Managers in departments and shifts in which there is physical production tend to consider themselves superior to managers from the so-called "nonproductive" departments and shifts.

Conflict may also exist between the levels of an organization. This conflict is not so much the problem of rebellion against authority which has been discussed as it is the problem of the organizational relationship between the various management levels. Tension may arise between the levels of management because of their different functions and because of their varying authority and responsibility. Just as each specialist sees the organization from his point of view and just as each departmental manager views the organization from his position, so each level of management sees the organization from its own situation. As the perspective differs at each level, complications arise. Each level tends to feel that if it were not for the mistakes of those levels above and below, life would be much easier and the organization would be more prosperous.

The problem is further complicated by the fact that there is always pressure from both above and below; there may be pressure from above for more production while from below there is pressure for an easier life. The manager caught between the two feels in conflict with the sources of both pressures. In addition, the manager often feels that he is not getting the backing of his superiors which in turn heightens tension.

⁸ T. E. Stephenson, "The Changing Role of Local Democracy. The Trade Union Branch and Its Members," *Sociological Review*, Volume 5, Number 1, July 1957.

This is often seen as a problem faced by the foreman in British industry, who feels that he is neither management or worker, that he is out on a limb with little support from higher management if he has trouble with the unions.

Organizational conflict also arises sometimes when two or more firms combine. There is a conflict between loyalty to the old firm and loyalty to the new organization. There may be constant reference to the good old days and a feeling that something has been lost: power, status, cooperation, and so on. This situation may not be true, but there is a readiness to look back to the past through rose-colored spectacles.

There is another problem arising out of amalgamation, the question of who is placed in the responsible posts. Members of one of the original firms may feel that their prestige has suffered when none of their managers are given high posts in the new organization. Where a small firm is amalgamated with a large organization, its members may be in conflict, feeling they have been swallowed up and have lost their identity; as a result the members are not particularly willing to cooperate.

Conflict of the organizational type arises between individuals and departments when responsibilities and jurisdictions have not been clearly defined. When there is no definition of standard practice, there are often fringe decisions and actions, fringe in the sense of being on the periphery of an individual's or department's normal work. These decisions and actions may not be made, the people concerned throwing the responsibility onto others. This situation in itself is sufficient to cause conflict. On the other hand, someone may make decisions at the fringe of his jurisdiction and find that someone else claims that the decisions should really have been made by him. Again conflict results. Action, or lack of action, both can lead to conflict.

From a survey of organizational conflict, the sources of personal conflict may be considered. One particular source of disagree-

ment is the possible division between those managers who have reached the ceiling of their own careers and their administrative superiors who may still be able to rise higher in the organization. Conflict may also develop between these "static" managers and those who, at the moment, may be lower in the management hierarchy but who will eventually go ahead of them. In both cases there may be a sense of frustration for those who are in the "dead end" positions, though the "dead end" may be quite high up the management ladder.

The attitudes of these static managers to those already above them is summed up in the feeling that "it is all very well for them but they have prospects, they are not stuck in this place." They often regard those who are moving up as lucky, and "if only I had had their opportunities I would have gone far" (this comment also being applied to those above them who have better professional and academic qualifications). The very fact that this situation can occur quite high up the management ladder makes it all the more serious because it can lead to a breakdown of communications between top management and those subordinate to the frustrated managers.

Conflict may also arise between managers who have not been promoted and those who have been promoted over their heads. In the same way, it occurs between people who had expected to be promoted and the managers brought in from outside to fill the vacancies. This type of conflict is a variation on that which develops out of the "dead end" situation. It is, however, very real and may lead to frustration and a refusal, often silent, to cooperate with the successful candidate.

Further conflict may arise as a result of differing social origins and present backgrounds. While it may be true that "the prevailing social ideas of plant managers are not significantly different from those of top management"⁹ insofar that they both feel they

⁹ Delbert C. Miller and William H. Form, *Industrial Sociology* (New York: Harper & Bros., 1951) p. 206.

occupy their high positions by virtue of their abilities, both believe in the importance of managerial responsibility and support the dominant values in the community. There is nevertheless room for differences within and between the various levels of management.

It is possible that conflict may occur between science graduates and arts graduates and between graduates and those managers who have attained their present position without any academic qualifications. In the former case, the conflict may arise from the two distinctive, different academic backgrounds and training. In the latter case, it may be a conflict between differing social origins and values. The graduate may emphasize the need for a firm theoretical background; the nongraduate may stress the need for practical experience gained by working up from the shop floor, possibly laying greater stress on the virtues of hard work.

A particular form of this problem may arise where there are graduate management trainees in an organization. It often happens that nongraduate managers have to assist them, and differences in outlook may lead to tension. Further, the nongraduate manager's future career may be slow in comparison to that of the graduate. Indeed, the nongraduate may be helping to train his future chief and may feel that this is asking a great deal. Frequently it is not simply a conflict between nongraduate managers and graduate trainees, between the experienced manager and the learner. It is a heightened clash between different sets of values, between long established loyalties and new loyalties, between acceptance of the status quo and the advocacy of change.

These differences are even more complex than is already indicated. It is not simply a matter of science or arts, graduate or nongraduate. It is also often a question of which university a graduate manager attended. In England, there may be groupings arising out of whether people went to one of the "older" universities i.e., Oxford or Cambridge, or whether they went to one of the newer provincial universities.

Among nongraduates there may also be conflict arising out of differing working origins, between those who commenced their careers in the organization and those who came from other organizations, between those who started in low status departments and those who commenced in high status departments.

A general problem in some areas arises out of the geographical origin of the manager. If he was born in the South of England and goes to work in the North, it may take some time for him to become acceptable to the locally born managers. His actions and his comments can easily be misinterpreted, and conflict can result.

Differences of education and of geographical origin are not the only causes of conflict. Differences of political outlook, of religious conviction, differences of what is considered right and wrong in business—all these can create tension and lead to conflict.

Summary

These then are some of the sources of conflict within the structure of management. Conflict may arise from resentment at certain types of authority; it may also develop out of the organizational structure—conflict between the specialist and line management; between specialists, between departments, between shifts; conflicts between different levels of management and between individuals and departments when jurisdiction is vague.

Conflict may also be of a personal nature arising out of different prospects, differing educational, geographical and social backgrounds. The difference between conflicts of an organizational type and those of a personal type must not be allowed to obscure the fact that the organizational conflicts are expressed through people.

The conflicts that have been examined tend to occur when the needs and aspirations of the individual manager have been or have appeared to be threatened, when the exercise of authority has conflicted with his notion of human dignity, when his security, his

status and his exercise of power have been under pressure, and when he has felt that he is not receiving fair treatment.

The problem for higher management is to determine how far some attempt should be made to remove the causes of the tension. Obviously the conflicts we have described are disruptive; they can be costly in terms of production, finance and human effort. Yet it can be argued that some conflict is essential to constructive work, and that to seek to

remove all conflict is impossible and unwise. If this position is accepted, higher management is not simply called on to observe the sources of conflict within the management structure and to seek to remove them, it is required to accept some measure of conflict, to control it so that it doesn't destroy the aims of the organization, and to develop wherever possible "constructive conflict" which will help and not hinder the organization.

An organization belongs on the sick list when promotion becomes more important to its people than accomplishment in the job they are in. It is sick when it is concerned more with avoiding mistakes than with taking the right risks, with counteracting the weaknesses of its members rather than with building their strength. But it is sick also when "good human relations" become more important than performance and achievement.

Peter F. Drucker
Landmarks of Tomorrow
 (Harper & Brothers, New York)

communications from readers ...

From:

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Director of Research
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The article "What Do We Know About Using Long-Range Plans," by George A. Steiner (*California Management Review*, Fall, 1959) adds useful insights to the planning process and contributes to the too-sparse literature on the subject. Future work on the planning process may be more fruitful if the distinction between long-range objectives and short-run plans is given more prominence.

The planning process spells out long-range objectives by selecting among various alternatives, proposals, forecasts, and competing idealizations of what should be. These long-range objectives influence the tone, direction, and patterns of today's decisions and actions.

Planning is a continuous process, both in the sense of the guidance it provides for day-to-day decisions and in the sense of the periodic reformulation that basic objectives must undergo in the light of intermediate successes and failures. Plans must adapt to facts, forces, and results not previously foreseen, to new forecasts, to new proposals, and to revised value judgments.

Short-run plans call for firm decisions of what is to be done, when it is to be done, who is going to do it, and how it is to be accomplished. The short-run programs of action, time schedules, and cost estimates or resource requirements are expected to be adhered to; any achievement or shortfall, success or failure is expected to be, and is, objectively audited insofar as goals, time schedules, and costs have been set forth in objectively measureable quantities.

The existence of the long-range objectives narrows the number of alternatives to be considered in arriving at a short-run plan. One

criterion for adopting a short-run plan is that it will be accomplished, thereby contributing toward intermediates of the long-range objectives.

Long-range objectives, in contrast, are rarely accomplished. Major changes and goals are delineated; the blueprint may omit many details of the future condition being planned for and may include goals not expressed in quantitative auditable terms. It is essential that, regardless of how expressed, the long-range objectives represent a consensus, either by fiat or by agreement, of the major outlines of a state of affairs that would be desirable. For a variety of reasons basically springing from human inability to predict all the events years in advance, an objective scheduled for, say a decade in the future is frequently judged undesirable a few years after its original formulation. A new and changed objective to extend a few more years into the future is developed.

There is one other aspect of the long-range planning process and the unpredictability of the future that causes objectives to be re-evaluated at intermediate stages, recast, and extended farther into the future. Long-range objectives are inherently either high or low, conservative or risky. High objectives run the risk of not being achieved or of some overbuilding before the objective is realized as unobtainable. Low objectives run the risk of being accomplished at the cost of foregoing a better state that hindsight demonstrates could have been achieved.

In conclusion, then, the distinction between long-range objectives and short-run plans turns on the differential importance to each of "feasibility" as against "desirability." A short-run plan that is not achieved was a bad plan; a long-range objective will be superseded by other values long before the scheduled accomplishment date has been reached.

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